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## HYDRO-PSYCHOSES.

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By FREDERICK E. BOLTON, Late Fellow in Psychology, Clark  
University.

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In this study we wish to investigate the influence that water has exerted in shaping and moulding man's psychic organism. The thoughts expressed in literature have been greatly influenced by pelagic conditions. Not only are there accounts of water spirits, nautical tales, etc., but almost every page bears evidence through metaphor of the modifications of thought and expression by water. Note the phrases "stemming the tide," "current of thought," "flowing robes," "torrents of joy," "a total wreck," "drown grief," "sinking in adversity," "ebbing life," etc. The poets have been especially inspired by the sea, the brook, the rill, etc. Many of the poems relating to water have been set to music, and have played a great rôle in religious worship. Hymnology is replete with allusions to water. What is now poetical allusion was in primitive times the expressions of belief. The poetry of to-day was the philosophy of yesterday. So, too, mythology chronicles as mere tales former firm beliefs. In this we find abundant evidence of the great influence water exerted upon savage peoples. Nearly all primitive peoples had their water spirits, and even the rivers and seas were supposed to be alive. The literature of all nations abounds with tales of fountains of youth, rivers of life, etc. Omens, superstitions, sayings relating to water and to water gods are numerous. Philosophy, religion, medicine, mythology, have all been influenced by various ideas concerning water.

Besides the foregoing, all people have feelings about water which are only partially explainable by present relations and circumstances. Much may be explained by the vastness, the activity, the feeling of, individual experiences, etc., but there

is still a residuum wholly unaccounted for by individual experiences and by the phenomena themselves. Apparently, only the psychic history of the race can offer adequate explanations. If the causes do not not appear in the phenomena, the cause must be in the soul itself. The soul in its long period of development must have passed through experiences, the present manifestations of which are but reverberations of a remote psychic past. To trace the genesis of these conceptions and feelings and to study the reaction of people, both in the past and in the present, toward this phase of nature is the object of this investigation.

#### EVIDENCES OF MAN'S PELAGIC ANCESTRY.

There are several lines of argument which give such abundant proofs of man's pelagic ancestry that little doubt of it remains in the minds of scientists. Chief among these on the physical side are the proofs afforded by Embryology, Morphology, Paleontology and Pathology. Recent valuable additions have been made by a study of survival movements. By showing transitory characteristics in process, much may be gleaned indirectly from a study of these groups of animals which were once land animals, but which have returned to the sea.

Each of these classes of evidence, with the exception of that drawn from Paleontology, will be passed in review.

*Embryological, ua. General.* Man, like all other animals, begins life as a unicellular organism. The earliest stages of development which the human embryo passes through, so far as is known, resemble those of all other animals. The only difference between the development of the human embryo and the embryo of other animals is that the human embryo goes away beyond all other organisms in its unfoldment. But so close are the resemblances among the earliest embryonic stages that differences are unrecognizable. Some one has said, James, I think, that for some time no human being can determine whether a given embryo will turn out a frog or a philosopher. Romanes says<sup>1</sup> that when man's "animality becomes established, he exhibits the fundamental anatomical qualities which characterize such lowly animals as polyps and jelly-fish. And even when he is marked off as a Vertebrate, it cannot be said whether he is to be a fish, reptile, a bird or a beast. Later it becomes evident that he is to be a Mammal, but not till later still can it be said to which order of mammals he belongs."

Not only do the embryonic forms of all vertebrate animals, resemble each other in their general characteristics, but special organs or systems of the higher mammals, can be traced out in

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<sup>1</sup> Darwin and after Darwin, I, 119.

the various stages of development. It is well known that resemblances of the mammalian embryos to lower vertebrates flash out as each new step is attained. As Prof. Drummond has put it we have "first the resemblance of the Fish, then of the Amphibian, then of the Reptile, lastly of the Mammal."<sup>1</sup>

*b. Nervous System.* Considering the development of the central nervous system we find that different stages of the human embryonic brain have close homologies in some of the great groups of lower animals. Man's brain passes through a series of stages of increasing complexity. These stages are only temporary in the human embryo, while they represent the maximum development of the group corresponding to each stage. Prof. H. DeVarigny says: "One may easily detect in the evolution of the human brain a stage corresponding to that of the brain of fishes; but while the fishes permanently retain this brain-structure, an advance occurs in man, and the brain acquires characters of the reptilian encephalon; later on it progresses again, and acquires bird characters, and finally it acquires those characters which are peculiar to mankind. Here again, ontogeny demonstrates phylogeny."<sup>2</sup>

*c. Circulation and Respiration.* Romanes sums up what Darwin and others had first pointed out concerning the development of the foetal circulatory and respiratory organs by saying that, "at the time when the gill-slits and the gill-arches are developed in the embryonic young of air-breathing Vertebrates, the heart is constructed upon the fish-like type. That is to say, it is placed far forwards, and from having been a simple tube as in the worms, is now divided into two chambers, as in Fish. Later it becomes progressively pushed further back between the developing lungs, while it progressively acquires the three cavities distinctive of Amphibia, and finally the four cavities belonging only to the complete double circulation of Mammals. Moreover, it has now been satisfactorily shown that the lungs of air-breathing Vertebrata, which are thus destined to supersede the function of gills, are themselves the modified swim-bladders<sup>3</sup> or float which belong to Fish. Consequently all these progressive modifications in the important organs of circulation and respiration in the air-breathing Vertebrata, together make up as complete a history of their aquatic pedigree as it would be possible for the most exacting critic to require."<sup>4</sup>

*Rudimentary Organs.* In almost all animals and plants we find rudimentary or vestigial organs which serve no purpose in

<sup>1</sup> The Ascent of Man, p. 72.

<sup>2</sup> Prof. Henry DeVarigny: Experimental Evolution, p. 35.

<sup>3</sup> See Darwin: Descent of Man, pp. 160-61.

<sup>4</sup> Romanes' Darwin and after Darwin, I, 154.

the present life of the organism. Some of these appear only in the embryo, then become absorbed or pass away, leaving little or no trace of their presence. Everybody knows of the gills, tail, and swimming apparatus which frogs and toads possess during the tadpole stage, and which remain in adult life only as vestigial structures. There is a species of salamander (*salamander atra*) which lives high up among the mountains, brings forth its young full formed like the mammals, but whose tadpoles, or young, possess exquisitely feathered gill-slits. If the young chance to be removed from the body of the mother before the close of the normal period of gestation, the young salamanders will swim away like fish if placed in water. When born at full term they will drown as will the adult animal if placed in water. These organs, adapted to aquatic life, and which have "reference to ancestral adaptations, repeat a phase in the development of its progenitors."<sup>1</sup>

The life history of individuals cannot in every case, of course, present a full and complete recapitulation of its ancestors. To preserve all useless structures would be a waste of energy and material, and nature is never prodigal. The law of use and disuse are ever operative. As soon as structures lose their functions they tend gradually to disappear. If detrimental they are the sooner dropped off.<sup>2</sup> The vestigial or obsolescent structures which come regularly under our notice in any class of individuals are undoubtedly those which subserved some unknown purpose during embryonic life, or they are such as have only recently ceased to function. Those that appear occasionally, but are absent in the normal individuals, are probably the reverberations of long-since abandoned organs, but have become reawakened through stimulations that have called forth functions similar to those possessed by the organ in question, or they may belong to arrested development. To this class many pathological freaks and abnormalities may undoubtedly be referred. Romanes says that "the foreshortening of developmental history which takes place in the individual lifetime may be expected to take place, not only in the way of condensation, but also in the way of excision. May pages of ancestral history may be recapitulated in the paragraphs of embryonic development, while others may not be so much as mentioned."<sup>3</sup>

*Vestigial Structures in Man.* In the human body there are numerous obsolescent organs, which persevere in form only, and give unequivocal evidence of former ancestry. There are in all upwards of 130 that have been discovered. The vermi-

<sup>1</sup> G. H. Lewes, in Darwin's *Origin of Species*, p. 398.

<sup>2</sup> Romanes' *Darwin and after Darwin*, I, 103.

<sup>3</sup> Darwin and after Darwin, I, pp. 103-4.

form appendix is one of the best known. It is as fully developed during foetal life as in adult. The muscles by means of which the external ear is moved is demonstrable only in exceptionally atavistic individuals. The *panicules carnosae*, or muscles by means of which animals move the skin, still exhibit vestiges of former function in man. Club-feet are said to be atavistic reminiscences of remote ancestors, meaning no more nor less than baboon feet.<sup>1</sup>

"Prominent among these vestigial structures are those which smack of the sea. If embryology is any guide to the past, nothing is more certain than that the ancient progenitors of Man once lived an aquatic life. At one time there was nothing else in the world but water-life; all the land animals are late inventions."<sup>2</sup> After emerging from the annelide and molluscan stages, what was to become man remained in the water until evolution had produced a fish-like stage; "after an amphibian interlude he finally left" the watery domain, but "many ancient and fish-like characters remained in his body to tell the tale."<sup>3</sup>

One typical vestigial structure which dates back to sea ancestry is the *plica semi-lunaris* or the remnants of the nictitating membrane of fishes. It is a semi-transparent curtain-like membrane formed on the inner side of the eye as a vertical fold of the conjunctiva,<sup>4</sup> which apparently is of great utility in sweeping across the eye to cleanse it. It is very common among birds, some fishes, reptiles, and amphibians,<sup>5</sup> and most vertebrates.<sup>6</sup> In man only a small fold or curtain draped across one side of the eye, and Romanes states that it is rudimentary only in animals above fishes.<sup>7</sup>

The most unequivocal rudimentary structures which give indication of water ancestry are the visceral clefts, or gill-clefts, in the neck-region. These were the first discovered vestigial structures to indicate the probable line of descent. These structures are first seen in the amphioxus, the connecting link between invertebrates and vertebrates. "In all water-inhabiting Vertebrates which breathe by means of gills the thin epithelial closing plates break through between the visceral arches, and indeed in the same sequence as that in which they arose. Currents of water, therefore, can now pass from the outside through the open clefts into the cavity of the fore gut, and

<sup>1</sup> Drummond : Ascent of Man, p. 96.

<sup>2</sup> Drummond : The Ascent of Man, p. 83.

<sup>3</sup> *Loc. cit.*, p. 85.

<sup>4</sup> Text-book of Embryology, Hertwig-Mark, p. 487.

<sup>5</sup> Darwin : Descent of Man, p. 17.

<sup>6</sup> Hertwig-Mark : A Text-book of Embryology, p. 487.

Darwin and after Darwin, I, 74.

be employed for respiration, since they flow over the surface of the mucous membrane. There is now developed in the mucous membrane, upon both sides of the visceral clefts, a *superficial, close*, network of blood-capillaries, the contents of which effect an exchange of gases with the passing water. Likewise in the case of the higher (amniotic) vertebrates,<sup>1</sup> both inner and outer visceral furrows, together with the visceral arches separating them, are formed ; but here they are never developed into an actually functioning respiratory apparatus ; they belong, consequently, in the category of rudimentary organs. Upon the mucous membrane arise no branchial leaflets ; indeed the formation of open clefts is not always and everywhere achieved, since the thin epithelial closing membranes between the separate visceral arches are preserved at the bottom of the externally visible furrows."

The number of gill-clefts and visceral arches decreases in the ascending scale of vertebrate life. In some of the lower species, as the selachians, there are seven or eight, while birds, mammals and man, possess but four.<sup>2</sup> The number of external openings, also, is found to constantly decrease as we ascend the scale of life. In the higher mammals and man they would scarcely be known were it not for their detection in the embryonic stage. But they are discernible in the chick embryo on the third day of incubation, and they may be seen distinctly in the human embryo according to His when the embryo has attained a length of three or four millimeters. They begin to become obliterated by the fourth week of foetal life.<sup>3</sup> But still says Drummond "so persistent are these characteristics [gill-slits] that children are known to have been born with them not only externally visible—which is a common occurrence—but open through and through, so that fluids taken in at the mouth could pass through and trickle out at the neck. . . . Dr. Sutton has recently (*Evolution and Disease*, p. 81) met with actual cases where this has occurred. . . . In the common cases of children born with these vestiges the old gill-slits are represented by small openings in the sides of the neck, and capable of admitting a thin probe. Sometimes, even, the place where they have been in childhood is marked throughout life by small round patches of white skin."<sup>4</sup> Dr. Hertwig also mentions the fact that fistulæ, which penetrate from without inward for variable distances, sometimes even opening into the pharyngeal cavity, are to be met with in human beings.

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<sup>1</sup> *Text-book of Embryology*, Hertwig-Mark, pp. 286-7.

<sup>2</sup> *Ibid.*, p. 287.

<sup>3</sup> Hertwig-Mark : *Text-book of Embryology*, pp. 288-9.

<sup>4</sup> Drummond : *Ascent of Man*, p. 81.

These are explainable as being still open clefts of the cervical sinus.<sup>1</sup>

The ultimate metamorphosis of the embryonic gill-clefts is still a question of much interest. There is little doubt but that the thymus and probably the thyroid gland are derived from the visceral clefts.<sup>2</sup> The thymus is derived, according to Kölliker, Born and Rabl, from the third visceral cleft. Some authorities, among them De Meuron and His, differ in minor points, principally as to the number of clefts involved,<sup>3</sup> but in the main they agree. The thymus is found in all animals, beginning with the fishes. Even in the fishes it is derived from epithelial tracts of the open gill-clefts still functionally active. Dohrn holds that the thyroid gland is the remnant of ancient gill-clefts of the vertebrates. Although this is disputed by Hertwig he still admits that "it appears to be an organ of very ancient origin, which shows relationship to the hypobranchial furrow of *Amphioxus* and the *Tunicates*."<sup>4</sup> It, at any rate, gives strong evidence of the close relationship, being developed "from an unpaired and a paired evagination of the pharyngeal epithelium,"<sup>5</sup> and in the region of the former visceral clefts, and by good authorities it is claimed to be developed from them. The so-called accessory thyroid gland is conceded by all to have thus arisen. The unpaired fundaments which contribute toward the thyroid are not wanting in a single class of vertebrates.<sup>6</sup> Dohrn makes several bolder hypotheses concerning the metamorphosed products of the embryonic clefts. He maintains (1) "that the mouth has arisen by the fusion of a pair of visceral clefts, (2) that the olfactory organs are to be referred to the metamorphosis of another pair of clefts, a view which is also shared by M. Marshall and others, (3) that a disappearance of gill-clefts in the region of the sockets of the eye is to be assumed, and that the eye-muscles are to be interpreted as remnants of gill-muscles."<sup>7</sup> Hertwig, however, dissents from some of these views. But, most embryologists are agreed that the middle and outer ear are derived from the upper portion of the first visceral cleft and its surroundings. In fishes there is no external auditory apparatus, and these organs, which in man develop into an ear, subserve another purpose. The Eustachian tube represents a partial closure of an original cleft; the tympanic membrane is devel-

<sup>1</sup> Hertwig-Mark: Text-book of Embryology, p. 290.

<sup>2</sup> *Ibid.*, p. 316.

<sup>3</sup> *Ibid.*, p. 316.

<sup>4</sup> Hertwig-Mark: Text-book of Embryology, p. 317.

<sup>5</sup> *Loc. cit.*

<sup>6</sup> *Loc. cit.*

<sup>7</sup> Hertwig-Mark: Text-book of Embryology, p. 288.

oped from the closing plate of the first visceral cleft and surrounding portions of the arches; and the external ear is derived from the ridge-like margins of the first and second visceral arches.<sup>1</sup>

"Ears are actually sometimes found bursting out in human beings half way down the neck in the exact position—namely, along the line of the anterior border of the sterno-mastoid muscle—which the gill-slits would occupy if they still persisted. In some families, where the tendency to retain these spacial structures is strong, one member sometimes illustrates the abnormality by possessing the clefts alone, another has the cervical ear, while a third has both the cleft and a neck ear—all these, of course, in addition to the ordinary neck ears."<sup>2</sup>

*Survival Movements.* An exceedingly interesting and important study, and one which sheds much light upon the present problem, was carried out by Dr. Alfred A. Mumford, of England.<sup>3</sup> He noticed the peculiar paddling or swimming movements which a young babe, a few days old, made when it was placed face downwards with only hands and feet touching the floor, its head and abdomen being supported by a hand placed under each. Being struck with the great similarity of these movements to those made in propulsion through a watery medium he began a systematic study of infants' movements. Besides confirming and extending many of the recent observations concerning an anthropoid relationship he makes statements which are much more far-reaching.

He has noted that the position of the limbs at birth and during the first few weeks of infancy tend to assume the primitive developmental position, viz.: "folded across the chest, thumb towards the head, and with the palm towards the thorax; but more often the palm is away from the chest-wall, and is directed anteriorly by means of extreme pronation, the dorsum of the hand often lying on or near the shoulder, sometimes an inch or two outside. As the child wakes up the elbows begin to open out and the palm is pushed outwards in a way that would be useful in locomotion, especially in a fluid medium. In fact it is the movement of the paddle." These movements are described as slow rhythmical movements of flexion and extension, such as one sees among animals in an aquarium. They occur often in series of three at a time during a quarter of a minute, followed by alternating pauses. These are interpreted as vestigial movements of a former amphibian existence, which were of fundamental importance before forelimbs developed.

<sup>1</sup> *Ibid.*, pp. 505, 511.

<sup>2</sup> Drummond: *Ascent of Man*, p. 89.

<sup>3</sup> *Brain*, 1897.

This is supported by the shape of the hand, which is one of the most highly developed of bodily organs in function, but in some respects least modified of all the skeleton. "In shape and bones it is more like the primitive amphibian paddle than is the limb of any other mammal."

We also know that there are many reflex movements known as vibratory or oscillatory, which are especially common among children, though by no means confined to them. Among them are those of tapping, swaying, and others of a rhythmical nature.<sup>1</sup> Swaying from side to side is very noticeable in small school-children. They sway from side to side and forward and backward. Fish swim, in part, by similar movements, and in view of man's pelagic line of ascent, it is not improbable to suppose that swaying and possibly other reflex rhythmic and oscillatory movements may be recrudescences of former aquatic life. That they are atavisms, seems borne out by the fact that intellectual fatigue increases such automatisms.<sup>2</sup> That is, fatigue causes a temporary relaxation of the control exercised by the higher and more recently developed psychic centers and a reversion toward more primitive conditions. It is probable that all automatic movements, as well as expressive movements, are weakened repetitions of movements that were once of utility.<sup>3</sup>

#### ORIGIN OF ANIMAL LIFE.

Not only have speculative philosophy and mythology claimed for everything a sea origin [see later sections in this paper] but science has actually demonstrated that the beginning of life was in the sea—near the bottom. This is as true of vertebrate as well as of invertebrate life.<sup>4</sup> Dr. Brooks writes: "We may feel sure even in the absence of sufficient evidence to trace their direct paths, that all the great groups of Metazoa ran back to minute pelagic ancestors."<sup>5</sup> Another authority writes that "for the present we may conclude that the proximate ancestor of the vertebrates was a free-swimming animal intermediate in organization between an ascidian tadpole and amphioxus." The same writer claims that the ultimate or primordial ancestor

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<sup>1</sup> See Dr. T. L. Bolton's article on Rhythm, *Am. Jour. of Psych.*, Vol. VI, p. 145.

<sup>2</sup> Lindley: Motor Phenomena of Mental Effort, *Am. Jour. of Psych.*, Vol. VII, p. 506.

<sup>3</sup> See Lindley, *loc. cit.*

<sup>4</sup> W. K. Brooks: The Genus *Salpa* Mem. Biol. Lab., Johns Hopkins Univ., p. 153.

<sup>5</sup> W. K. Brooks: The Genus *Salpa*, p. 159; see also p. 163.

of the vertebrates was a worm-like animal with an organization approximating the bilateral ancestors of the echinoderms.<sup>1</sup>

Science has also shown us that a great body of animals have been gradually crawling out of the sea. "From almost every country pond, or ditch, or swamp," says Miss Buckley, "a chorus of voices rises up in the spring-time of the year, calling to us to come and learn how Life has taught her children to pass from the water into the air; for it is then that the frogs lay their eggs, and every tadpole which grows up into a frog carries us through the wonderful history of animals beginning life as a fish in water with water-breathing gills, and ending it as a four-legged animal with air-breathing lungs."<sup>2</sup>

All the amphibians, or double-lived animals, are just emerging from the water. We find them in all stages of transition, some having only just begun to emerge, while in others the transition is so nearly complete that their former identity is scarcely discernible.<sup>3</sup>

But the young of all amphibians begin life in an aqueous medium, thus recapitulating, as all animals do, the life of the race. In embryonic, or tadpole life, all amphibians possess gills for extracting oxygen from the water, and organs for water locomotion. It is only when they reach an adult stage that they possess organs which equip them for terrestrial existence.

#### ANIMAL RETROGRESSIONS TO AQUATIC LIFE.

But there have been many retrogressions in the process. Many animals after rising step by step above the fishes, and through the backboneed animals until they reached a rank only a little below the primates, for some reason have gone back to the sea. The French song says "on revient toujours à ses premiers amours." Among those that have completely forsaken the land and assumed fish-like characters such as to almost elude detection are the whales, porpoises, and dolphins. Their fish-like forms and marine habits seem to indicate affinities with the fishes. But their internal structure, breathing, and mode of reproduction and suckling the young proclaim their mammalian kinship. They resemble quadrupeds in their internal structure, and in some of their appetites and affections. Like quadrupeds they have lungs, a midriff, a stomach, intestines, liver, spleen and bladder. The organs of generation and heart are quadrupedal in structure. "The rudimentary teeth of the whalebone-whales, which never come into use, are final

<sup>1</sup> Arthur Willey: *Amphioxus and the Ancestry of the Vertebrates*, p. 291.

<sup>2</sup> Arabella Buckley: *Winners in Life's Race*, p. 71.

<sup>3</sup> Dr. W. K. Brooks: *The Genus Salpa*, *Memoirs fr. the Biol. Lab.*, Johns Hopkins Univ.

links in the chain of evidence." says Professor Oskar Schmidt,<sup>1</sup> "that the whalebone-whales are the last members of a transformed group which commenced with animals with four toes and numerous teeth, and which, by the gradual diminution of the dentition, have become whalebone-whales." The fins still retain the bones of the shoulder, forearm, wrist and fingers, though they are all enclosed in a sac and could render no service except in swimming. The head is also mammalian save in shape, which has become modified and fish-shaped for easier propulsion in the water. The mammalian skull with all the bones in their proper anatomical relations to one another are still preserved.<sup>2</sup> Prof. Schmidt says in regard to the dolphin that the "hind limbs, like those of the Sirenians, have disappeared externally without leaving a trace of their former existence; the rudimentary pelvic bones that are concealed in the flesh—sometimes with the last remnant of the thigh bone, very rarely with the shank—bear witness, however, to their having possessed ancestors with four legs."<sup>3</sup>

There are several species of animals that exhibit the transformation still in process. Such, for example, is the polar bear, which is about half aquatic. This animal really gave us the first hint that some mammals may revert to a water stage of existence.<sup>4</sup> His body, much longer and more flexible than that of common bears, enables him to adapt himself to water locomotion. His feet have become decidedly broad, his head pointed, and his ears small, thus enabling him to propel himself through his aqueous habitat with ease. Other bears hug their prey, while this one uses teeth and claws entirely. The soles of his feet have become provided with long hair, which provide against slipping on the ice. They have largely lost their hibernating habits, and fish and hunt throughout the winter.<sup>5</sup> The seals show by the shape of their skull, dentition, and mode of life that they are carnivorous animals that have adapted themselves to a life in water. Their limbs are metamorphosed into fin-like rudders.

Instead of a perfect fish-like tail he has two legs flattened together, with nails on the toes. These are obvious superfluities, but remain as an inheritance from ancestors to which they were of use, but they have now become modified by the present fish-like habits of the animal. Sea otters, the nearest relatives of the seal, have also become pure fish-eating animals. The

<sup>1</sup>The Mammalia, p. 248; see, also, J. G. Romanes, Darwin and after Darwin, I, 50.

<sup>2</sup>Romanes, Darwin and after Darwin, II, 51.

<sup>3</sup>The Mammalian, p. 250.

<sup>4</sup>Arabella Buckley: Winners in Life's Race, p. 295.

<sup>5</sup>*Op. cit.*, pp. 295-8.

*Sirenia*,<sup>1</sup> which comprise the dugongs and manatees resemble the true *Cetacea* (whales, dolphins and porpoises) in their adaptation to an aquatic mode of life and the absence of pelvic limbs, but are probably more nearly allied to the *Ungulates*. These now aquatic animals are plainly retrogressions from the regular land type. They are somewhat fish-like in form, the posterior portion of the body being developed into a caudal fin. Hind limbs are lacking, and the forelimbs have been modified into swimming-paddles or flippers. The ear has lost the external concha. A few bristles still cover the thick skin and tell of former life. They are vegetable feeders (called herbivorous Cetaceans by Cuvier). There are two mammary glands, pectoral in position. The pelvis is rudimentary, some teeth are rudimentary, and some species possessed a rudimentary femur. They date back to the Eocene Tertiary period, while the cetacea probably extend to the secondary period.

Among reptiles which represent these atavistic traits there are the oceanic turtles, and the sea snakes; among the birds, the penguin, whose wings are scarcely different from the true fins of fishes. Then, again, from the mammals might be named the web-footed, duck-billed platypus, the web-footed opossum of South America, the beaver, and the walruses and sea lions.<sup>2</sup>

In all these classes of animals that have returned to aquatic life, we notice that in the process of evolution the most marked changes have taken place in the least typical structures,—those which are least strongly inherited, such as skin, claws and teeth. The aqueous medium necessitates a change of covering. Instead of fur, which we know (from the few straggling bristles) they once possessed, a smooth surface, offering little resistance is advantageous. To still maintain adequate bodily heat a covering of fat under the skin is acquired. The whale has evolved a layer of blubber in some cases one and one-half feet thick. The changed medium modifies the locomotor organs—does away with the necessity of legs and necessitates, instead, swimming apparatus. The anterior end becomes more pointed to reduce resistance to the minimum. It should be noted, however, that the head retains essentially all the functions it possessed, being modified only in form. In all cases the eyes become much reduced in size. In whales they suffer so much reduction that they can scarcely be found. The same change is taking place in the eyes of seals, polar bears, walruses, and other animals of this type. Dentition has suffered so much change that whales possess only rudimentary teeth that never cut the gum. In the living species of sirenians the jaws carry

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<sup>1</sup> Nicholson : Manual of Zoölogy, Chap LXVI.

<sup>2</sup> Arabella Buckley : Winners in Life's Race, p. 299.

more or fewer molar teeth, which have flattened crowns, while the front of the upper and lower jaws is furnished with rough horny pads or plates. In the genus *Rhytina*, now extinct, there were no true teeth, but the places of these were taken by plates of horn. Incisors are also present, but they do not cut the gum, except in the case of male dugongs. Nostrils become situated on the upper surface. The anterior organs of locomotion suffer much less change in form than the posterior, though they assume entirely new functions. In general the bones of the shoulder, forearm, wrist and fingers, are retained, although they become encased in a fin-shaped sac, so as to become better fitted for swimming.

The entire posterior end, as well as the hind legs, undergo a most radical metamorphosis. The hind legs are no longer needed for walking, and soon atrophy entirely or become merely rudimentary. In the whales, porpoises, and other animals, which have completely forsaken the land, the hind legs have completely disappeared externally, and only the rudimentary bones give evidence of the species ever having possessed legs. Synchronously with the atrophy of the hind legs there occurs a loss of the sacrum and pelvis. In the sirenians there is no true sacrum, and the pelvis is only rudimentary. The lungs instead of degenerating become enormously enlarged, and enable their possessors to remain under water great lengths of time. The whalebone whale can remain under water for an hour at a time without reinflating its lungs.

The reversion to an aquatic medium seems to be promotive of great increase in size. This is probably due to several causes. First, the expenditure of energy in locomotion is greatly reduced; second, the ease of securing food is greatly increased, the whale having only to open his mouth as he swims to entrap myriads of minute marine animals; third, it is probable that the loss of a pelvis is advantageous, as much larger young may be born without injury than when the pelvis is present. Among land vertebrates we know that many of the largest and most promising of the various species succumb to the dangers, attending birth, arising from a narrow pelvis.

*Psychic Reverberations.* We cannot hope to unravel all of man's mental history with any such demonstrable certainty as we can reconstruct his past physical history. Mental states are the most fleeting and least preservable entities, and although we must logically conclude that the record of no psychosis is ever effaced, yet the majority become so intricately blended and interwoven and overgrown with other more recent acquisitions that no psychology will ever be able to reconstruct the entire race history. Only the most oft-repeated and most far-reaching psychic acts leave traceable evidences. But patient and careful

work will enable us to understand much of man's psychic past through survivals and rudimentary organs, just as we have been aided in tracing psychical development. But just as all psychic organs are less demonstrable than physical, so rudimentary psychic phenomena are less capable of proof than vestigial physical structures. There is, however, unquestioned evidence of numerous rudimentary psychic traits and many others which, though not capable of rigorous demonstration, give strong evidence of their origin. Traces of peculiar manifestations of the souls of our remote ancestors are to be met with in "the present reactions of childish and adolescent souls, or of specially sensitized geniuses or neurotics." There are also times in the life of the normal individual when the control maintained by the higher and more recently acquired centers is apparently suspended, and the lower and older centers then given full sway seem to step in, and the resulting psychical phenomena present traces of long past activities. Such conditions are evidenced in sleep and dreams. Idiots present childish and even animal mentality, showing that the higher centers have failed to function. Instead of evincing rudimentary psychic phenomena in the true sense, they are cases of arrested development. Their lives are made up of those activities that are common to animals and to humanity in its infancy. Again, there are certain modes of thought that crop out in the form of omens, superstitions, sayings, proverbs and signs, to which we ordinarily attach no importance, but often hear and repeat. All these have a meaning to the psychologist. They are to him vestigial or rudimentary organs, and suggest use in a remote past. "Few things," says Black,<sup>1</sup> "are more suggestive of the strange halts and pauses which mentally a people makes than to note how superstition springs up in the very midst of modern education." They are to the psychologist what gill-slits are in pathological cases of arrested development. Children are very prone to be superstitious, which is also true of savages.

The range of atavistic psychoses is practically unlimited. Admitting memory to be a biological fact we assume that every impression leaves an ineffaceable trace, by which we mean that vestiges or predispositions or habit-worn paths of association are formed which will function again when properly stimulated. Conservation of impressions is a state of the cerebral organism. The effect once produced by an impression upon the brain, whether in perception or in a higher intellectual act, is fixed and there retained. The retention of any act in memory, according to James,<sup>2</sup> is an unconscious state, purely physical, a

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<sup>1</sup> Folk Lore in Medicine, p. 218.

<sup>2</sup> Prin. of Psych., I, 655.

morphological feature. According to Ribot we may assume that persistence of memories, "if not absolute, is the general rule, and that it includes an immense majority of cases."<sup>1</sup> This, of course, applies only to the persistence of memories during the individual's life, but, as Dr. Hall has pointed out,<sup>2</sup> "we may fancy, if we like, that on some such theory as, *e. g.*, Mach's of hereditary, or a form of memory by a direct continuity of molecular vibration in cells or their elements (Weissmann's biophor's, Wisner's plasomes, de Vrie's pangens, Nägeli's micellæ, etc.), or in any less material way," that these traces or vestiges are continued, and may, even though apparently forever effaced, reappear in future generations in children or pathological cases. Multitudes of impressions, even in the individual's existence, may never be recalled, but they might be if the proper stimulus occurred, or if more recent memory modifications were removed, and the older memories, as it were, set free. Evidence in support of such a theory is furnished by pathological cases. Events long since apparently forgotten often reappear in disease. This is accounted for by the destruction of the more recent and higher centers. According to Ribot the law of regression is that a progressive dissolution of the memory proceeds from the least organized to the best organized, from the new to the old. In physiological terms "degeneration first affects what has been most recently formed." In psychological terms "the complex disappears before the simple, because it has not been repeated as often in experience." Hence, may not such cases give us glimpses of the remote psychic past, even of the paleo-psychic age?

In sleep we have similar conditions. The higher centers having relaxed their control, there flash into consciousness great accumulations of old experiences that we did not know we possessed. Those which are the most retrospective and atavistic take us back through the remote periods of the development of the race consciousness. In the psychic life of sleep our consciousness may extend backward to embrace all that our ancestors have lived and felt and bequeathed to us as an indestructible organic patrimony." Some of the somnolent phenomena certainly point to aquatic existence. Consider the sensations of flying, hovering, swimming, floating, and jumping indefinitely, as with seven-leagued boots. Nearly everybody can bear testimony to these sensations. Sometimes it is a sort of skating or gliding across countless miles of country or of ocean, sometimes it is a giant-like striding from mountain-top to mountain-top, sometimes the perfect eagle-swoop through the blue of

<sup>1</sup> Diseases of Memory, p. 185.

<sup>2</sup> *Amer. Jour. of Psych.*, Vol. VIII, 173.

space, effortless and superb. Many testify to taking hundred-mile steps, for jumping contests imaginarily performed in sleep are of such a character as would excite the admiration of the fabled gods. These states undoubtedly arise from disturbed circulation and respiration, for both of these acts are much deranged in an actual fall through space. And, as Dr. Hall suggests,<sup>1</sup> "as lungs have taken the place of swim-bladders, the unique respiratory action of hovering, as in nightmare, with all the anakataesthetic phenomena, and perhaps the eluæsthetic sensations of a falling, which are quite distinct from the former, although not without common elements, suggest the possibility that here traces of function have survived structure. . . . Our ancestors . . . floated and swam far longer than they have had legs . . . and why may there not be vestigial traces of this, as there are of gill-slits under our necks? . . . Although it cannot be demonstrated like rudimentary organs, I feel strongly that we have before us here some of the oldest elements of psychic life, some faint reminiscent atavistic echo from the primeval sea."

The study of methods of suicide offers some very interesting data to the psychologist. The characteristic mode of procedure adopted by different nations throws light upon racial psychology, while the differences in the methods employed by men and women in accomplishing this terrible deed throw considerable light upon sexual psychology. All statistics show very strikingly that many more women than men commit suicide by drowning. And women choose this method more often than any other. This represents a fundamental psychic difference between men and women. The woman represents the oldest and most primitive features of the race; the man that which is more recent and artificial. This is also true from a biological standpoint. Woman's body seems to be somewhat more primitive and conservative than man's. This is witnessed in her greater nearness to the quadrupedal position, in the length of body, smaller size, etc. Woman represents that which is more conservative in the race. In woman there are seldom abnormalities of bodily structure, and variations are much less pronounced than in man. "From an organic standpoint, therefore, men represent the more variable and the more progressive element, women the more stable and conservative element in evolution. . . . In various parts of the world anthropologists have found reason to suppose that the primitive racial elements in a population are more distinctly preserved by the women than the men."<sup>2</sup> Of their mental characteristics the

<sup>1</sup> *Am. Jour. Psych.*, VIII, Jan., 1897, p. 158.

<sup>2</sup> Havelock Ellis: *Man and Woman*, p. 367.

same authority writes that "on the psychic side women are more inclined than men to preserve ancient customs and ancient methods of thought."<sup>1</sup>

If it be true that women are phylogenetically nearer primitive human beings than man, it is not strange that in methods of suicide they should choose the primitive and more natural means oftener than man. It would be strange were the statistics otherwise. The theory has often been advanced that the methods of suicide selected have a close connection with the occupation of the persons during life. To illustrate, a soldier would choose firearms, a druggist poison, etc. The theory is probably in a large measure true, but it in no way vitiates the theory that the most primitive and most conservative choose the most primitive methods. Statistics show that men prefer active methods, while women prefer passive methods. Women give themselves to the power of natural forces or elements, as, for example, to gravity when they throw themselves from heights or into the water and then wait for the end, while men make themselves the active agent in manipulating some artificial contrivance, a pistol, a rope, a bomb-shell, or the like. Many more women than men suicide by taking poison, which Dr. Chamberlain has pointed out to be an atavistic tendency. Women were the earliest agriculturists, and earliest learned the use of vegetables as articles of diet, as curatives, and as agents of destruction. From these early employments of women she learned to be a vegetarian, a trait she still possesses, and she earliest learned the use of poisonous herbs. The result of this last still reverberates through her organism, and to-day when woman determines to exterminate a fellow-being or an animal, poison is about the only means sought, while a man would employ a gun, a knife, or an explosive. In attempting her own life, though poison is often resorted to, a more primitive method is more often chosen. "Throughout Europe the law roughly stated is that men hang themselves; . . . with modifications this rule probably holds good all over the world."<sup>2</sup> In India, where the people represent a more primitive stage, according to Cheevers,<sup>3</sup> six out of every seven women who commit suicide seek drowning as a means. The proportion of men who drown themselves is also greater there than in other countries. In the Celto-Latin nations, France, Italy, Belgium, Sweden, Switzerland, drowning among women shows the highest percentages of any countries. For some reason or other among the Slavic nations

<sup>1</sup> Havelock Ellis: *Man and Woman*, p. 368.

<sup>2</sup> Havelock Ellis: *Man and Woman*, pp. 334-5.

<sup>3</sup> Quoted by Ellis: *Man and Woman*, p. 335.

drowning is at a minimum.<sup>1</sup> Strange to say, the atavistic tendencies are becoming stronger, according to Havelock Ellis, who says that "hanging has become much rarer in both men and women, while drowning and poisoning have become commoner in both. That is to say, that women have become more womanly than ever in their preference for the passive methods of suicide."<sup>2</sup>

May not many cases of suicide by drowning and the otherwise unexplainable "drawing power" of water so frequently experienced, be explained by supposing a temporary or permanent suspension of control by the higher psychic centers allowing a recrudescence of the old love for aquatic conditions. The fear which has been later formed, and which normally is in equilibrium with the love of water becomes overbalanced, and hence the desire to jump in. The philosopher, August Comte, during a fit of temporary insanity insisted on plunging into the lake with neither thought nor intention of drowning. The returns to my syllabus furnish many cases which attest to the feeling that water exerts a peculiar attraction for many individuals.

The sight of waves, billows, or in fact any water, makes some desire to ride upon it; many want to plunge in, and others are tempted to follow the streams. Some cannot go bathing without feeling an imperative impulse to go down forever; to leave care and pain; to end life; so they won't know any more, etc. One says she always thinks like Longfellow: "Oh that the river might bear me away on its bosom to the ocean wild and wide." During trouble many long to escape from it all by plunging in and being engulfed by the rushing waters.

#### WATER IN PRIMITIVE CONCEPTIONS OF LIFE.

We shall see that in all early Greek philosophy water was an integral part in all conceptions of life. Some assumed it to be the origin of all things; others said that water was *one* of the primitive elements, and that all plants and animals either came from or were made of water. The same ideas were current in mythology, and are prevalent among some people to this day. Peoples like the Egyptians, and those in southern and western Asia, who lived in countries subject to periodic drouths, were not long in concluding that water was necessary to the germination and growth of plants. During dry weather vegetation withered; during periods of abundant rain it waxed vigorously. They very naturally ascribed to water the powers of a supernatural being. It became to them not a condition of life, but the origin of life itself.

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<sup>1</sup> Havelock Ellis: *Man and Woman*, p. 336.

<sup>2</sup> *Ibid.*

The potency and life-giving properties ascribed to water are shown in Egyptian writings where "it appears in such phrases as 'spirit of water,' the source. It is a conspicuous hieroglyphic in the verb 'to live;' also in 'living' and light."<sup>1</sup>

Among the Ojibwas it is supposed to have magic power over life and death. It is not strange that among the Egyptians, where the annual overflow of the Nile meant life itself, that water deities should assume so important a place. The river was presided over by the god Nilus. The most important Egyptian festival was the one held at the annual summer solstice in honor of the Nile.<sup>2</sup> At this time an invocation was made to the river deity for the inundation. An image of the god Nilus was encircled by a serpent, and from beneath the rocks of a cataract a hydra poured forth sacred water.

The idea of resurrection undoubtedly grew, in part, out of the common observation of plant life. Vegetation flourishes during a season, appears to lose all vitality during a succeeding season, but when spring returns it becomes once more rejuvenated. Again, plants flourish, produce seed, and wither away. The seed in turn, under proper influences, germinates and produces new plants. It was but a step to arrive at the belief that man also, after death, must live again. We have seen that the primitive mind regarded water as the rejuvenating principles of all plant life, and hence it will not appear strange that the notion should be extended to include the resurrection of man.<sup>3</sup> Among the ancient Egyptians the ceremonials of the dead all indicated an expected resuscitation of life, and water was always made the emblem of rejuvenescence, whether in connection with human dead or with plants. In the Book of the Dead, water was the symbol of revivification. They "believed in the resurrection of the dead through the same fertilizing power as that which regenerates the plant world."<sup>4</sup> Primitive peoples generally, we may say, have taken cognizance of water in the ceremonials over the dead. And the return of life is always spoken of in connection with it. In Egypt funeral processions always had to pass by the sacred lake, which was near every city, and consecrated to the dead. In their funeral rituals the departed soul is represented as a ship with four rudders pointing to the four cardinal points. The ancient Hindoos buried the dead beneath the bed of a stream whose current was temporarily turned aside. The Greenlanders say that when one sleeps by the river he can hear the singing of the dead. Some Australians say that the soul, which they call the "little body," goes into the sea at death.

<sup>1</sup> Ellen Emerson : Rain Ceremonials, American Anth., Jul., 1894.

<sup>2</sup> Frazer : The Golden Bough, I, pp. 15-17.

<sup>3</sup> *Op. cit.*, I, p. 93.

<sup>4</sup> Ellen Emerson : Rain Ceremonials, Am. Anth., Jul., 1894.

Various symbolisms were early adopted to signify water. In Egypt it was Ptah, the frog, the "Father of Fathers," who was a symbol of the vital principle in water, its principle of reorganization. The hieroglyphic representing Ptah was regularly placed in the tombs of the dead. Its office was at some future time, to reunite the scattered parts of the body. Among some Indian and various other tribes the serpent symbolizes the watery element, air or breath, which are necessary to life.<sup>1</sup> We have also noted in various rain ceremonials the position of frogs, toads and serpents. In Babylonia, Thammuz was supposed to be resurrected by the water of life which the goddess Aphrodite brought up from Hades. That water was regarded by the Indic Aryans as the source of all things is shown in the Rig Vedas which tell us that "waters contained a germ from which everything sprang forth." The Peruvians worshipped Mama-cocha, the mother sea, from which had come everything, even giants, and the Indians themselves. In Peru water was everywhere worshipped, and it was believed that the Incas originated in lake Titicaca, while other fabled tribes came from fountains and streams.<sup>2</sup>

The rain ceremonials performed by various peoples for the purpose of securing rain are of exceeding interest. Although the details vary considerably the ceremonials may all be classed under a few heads. Sometimes rain is sought to be produced by *sympathetic magic*,<sup>3</sup> that is, it is believed that by imitating some of the attendant phenomena they can influence the course of nature. For example, by beating on a kettle to imitate thunder, knocking two fire-brands together and causing sparks to fly to imitate lightning, and sprinkling water from a vessel by a bunch of twigs, as is done in some parts of Russia, the people believe that rain will be produced.<sup>4</sup> Many tribes take a mouthful of water, spirt a part of it into the air, thus making a fine mist, to simulate rain. This is common among the Omaha Indians and certain other tribes.<sup>5</sup> In Germany and France it is said to be customary to throw water upon the last sheaf cut at harvest. The same custom prevailed in England and Scotland until recently. In Transylvania among the Roumanians a girl wears a crown made of the last cut grain. When she comes home all hasten out to meet her, and throw water upon her until

<sup>1</sup> See Ellen Emerson : Rain Ceremonials, Am. Anth., July, 1894, for account of Egyptian and N. Am. Indian rain ceremonials; also Weather-making, Ancient and Mod., Mark W. Harrington, Smithsonian Rep., 1894.

<sup>2</sup> Dr. Chamberlain : The Child and Childhood in Folk Lore, pp. 38-9.

<sup>3</sup> Ellen Emerson, *op. cit.*

<sup>4</sup> Frazer : Golden Bough, I, p. 13.

<sup>5</sup> *Op. cit.*, p. 15.

she is completely drenched. This is done to insure rain for next year's crop.<sup>1</sup> Sympathetic magic among the savages, Mr. Frazer regards as exactly analogous to the modern conception of physical causation. A man-god in this view, is only an individual who is believed to possess the power of influencing nature to a high degree.<sup>2</sup>

Another way of trying to secure rain is by *coercion* of the *rain-god*. In some parts of China a huge wooden or paper dragon, representing the rain-god is carried about in a procession. If no rain follows they curse it and demolish it. The Senegambians throw down their fetishes, drag them about the fields and curse till rain falls.<sup>3</sup> Still another way is to *disturb the gods* in some way. Troubling the sacred springs by throwing impurities into them is believed by the Dards to bring rain. Other springs need only to be looked at and the whole province secures rain.<sup>4</sup> Sometimes an appeal is made to the *pity of the gods*. The Zulus kill a "heaven bird," throw it into a pool, "then the heavens melt with tenderness for the death of the bird; it wails for it by raining, wailing a funeral wail."<sup>5</sup>

Various other methods are resorted to in different parts of the world. The Samoan rainmakers wet some sacred stones when they wish rain, and put them into the fire when they desire dry weather.<sup>6</sup> In China Ke-mung, who is man-shaped and dragon-headed, haunts the Chang River and causes rainstorms.<sup>7</sup> In the same country water-spouts are said to be caused by dragons fighting in the air.<sup>8</sup> The *Dodola* or girl dressed in clothes made of grass, herbs and flowers, who goes about from house to house and sings while the housewife pours water over her, is a common rain-charm in southeastern Europe. It is found among the Servians, Greeks, Bulgarians and Roumanians.<sup>1</sup> Beating, pinching, and beheading frogs is quite a common rain-charm among the Orinoco Indians, and killing the frog is an old German rain-charm.<sup>2</sup>

#### WATER IN PHILOSOPHICAL SPECULATION.

Not only among savage tribes has water played an important rôle in their mythological explanation of the world, but even in philosophic thought water has been the subject of much speculation. It assumed an important place in early Greek cosmo-

<sup>1</sup> *Op. cit.*, I, p. 286.

<sup>2</sup> *Op. cit.*, I, p. 12.

<sup>3</sup> *Op. cit.*, I, p. 18.

<sup>4</sup> *Op. cit.*, I, p. 19.

<sup>5</sup> *Loc. cit.*

<sup>6</sup> Tylor: *Early History of Mankind*, p. 133.

<sup>7</sup> Denny's *Folk Lore of China*, p. 98.

<sup>8</sup> Conway: *Demonology and Devil-lore*, II, 107.

logical theories. The Greek philosophers were not the first to form theories of the origin of the universe ; such theories, more or less mythological of course, were extant among all tribes. But the Greeks were the first to seriously attempt to understand nature. Burnet says " the real advance made by the scientific men of Miletos was that they left off telling tales." <sup>1</sup> They had noticed the constantly changing aspects of nature, the eternal flux as Heracleitus later puts it, and their minds began to grope and yearn for some unitary principle to which the eternal succession of changing objects could be reduced. They did not, it is true, abandon the speculation concerning origins, but their scientific contribution was the search for a unitary principle in what was present. " They gave up the hopeless task of describing what was when as yet there was nothing, and asked instead what all things really are now?" <sup>2</sup> Parmenides asserts that " nothing comes into being out of nothing, and nothing passes away into nothing." But they observed the continual coming into being and corresponding passing away of particular things. From this it was natural to pass to the assumption of a substratum which was the ultimate and only reality. As " nothing comes from nothing, nothing can pass away into nothing, there must then be something which always is, something fundamental, which persists throughout all change, and ceases to exist in one form only that it may reappear in another." <sup>3</sup>

It is interesting to note the cause of the change in cosmological doctrine among the early Greeks. Much of the change was undoubtedly due to the increased knowledge of the sea, which had hitherto represented to them the boundless, at least so far as mortal knowledge was concerned. What was unattainable, beyond reach, unexplainable by natural means, was placed beyond the sea. Their world was bounded by the sea, it rested upon the sea, the mythical heroes dwelt in or beyond the sea. But with the increase of maritime knowledge in the 5th and 6th centuries B. C., old conceptions had to be abandoned for something new. At the time the *Odyssey* was composed, Odysseus met with Circe, the Cyclops, and the Sirens, not in the near and familiar *Ægean*, but in the " West," which meant to them beyond the known sea. <sup>4</sup> But with the increase of geographical knowledge it was discovered that the monsters and beings purported to be the inhabitants of countries beyond the sea, were no longer

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<sup>1</sup> J. Burnet: *Early Greek Philosophy*, p. 8.

<sup>2</sup> Burnet: *op. cit.*, p. 8.

<sup>3</sup> Burnet: *op. cit.*, p. 10.

<sup>4</sup> Geo. Grote: *Hist. of Greece*, I, 342-3.

there, and a doubt of their ever having been there arose.<sup>1</sup> About this time they changed the name of the "Inhospitable Sea" to the "Hospitable Sea."<sup>2</sup> They had determined the location of the "far country," and Jason was made to bring the Golden Fleece from a definite place Kolchis.<sup>3</sup> Burnet says, "above all, the Phokaians had explored the Mediterranean as far as the Pillars of Herakles, and the discovery that the 'endless paths' of the sea they knew had definite boundaries must, as Grote has said, have moved men's minds in much the same way as did the discovery of America in later days."<sup>4</sup>

To return to their cosmological theories, we can readily understand how in their search for the eternal, original, unitary substance through whose changes and motions all else arose, that they should turn to those things which were either ever present, most abundant, or presented the greatest possibility of change, but which at the same time appeared to possess some simple form beyond which further change was impossible. This the various philosophers thought they discovered in the elements,—earth, air, fire and water. Some chose one, some another, and still others believed that all were necessary for a satisfactory explanation.

*Thales*, the founder of the Milesian school, and probably the first of the cosmologists in seeking a primary, fundamental matter, something which would answer the question: Of what is the world made? proposed the answer: *water*. All special existences were but modes of this primary substance. He saw about him "constant transformations—birth and death, change of shape, of size, and of mode of existence—he could not regard any one of these variable states as Existence itself. . . . He looked around him, and the result of his meditation was the conviction that Moisture was the Beginning. He was impressed with this idea by examining the constitution of the earth. There, also, he found moisture everywhere. All things he found nourished by moisture; warmth itself he declared to proceed from moisture; the seeds of all things are moist. Water when condensed becomes earth."<sup>5</sup> Further, as Burnet points out the process that evaporation was continually going on around them, the phenomenon which rural people call the "sun drawing water" was then as observable as at the present day, and the conclusion was probably similar. The Greeks went a little further than the rustic of to-day, and asserted that this water passing into the sky by evaporation went to feed the heavenly

<sup>1</sup> *Op. cit.*, p. 334.

<sup>2</sup> J. Burnet: *Early Greek Philosophy*, p. 14.

<sup>3</sup> *Ibid.*

<sup>4</sup> *Ibid.*

<sup>5</sup> Geo. H. Lewes: *Hist. of Phil. from Thales to Comte*, Vol. I, p. 7.

fires. After coming down in rain they thought it changed into earth. Then from the phenomena of mists and subterranean springs they believed that earth once more was converted into water. They did not connect springs with rain, and the waters underneath the earth were regarded as an independent source of moisture.<sup>1</sup>

*Anaximander* (610 B. C.) did not agree, saying that the elements "are in opposition to one another,—air is cold, water moist, and fire hot,—and therefore if any one of them were infinite, the rest would cease to be by this time."<sup>2</sup> He regarded the world, according to Burnet, as a boundless mass or body out of which "our world once emerged by the 'separating out' of the opposites, moist and dry, warm and cold."<sup>3</sup> But, although Anaximander made a great advance over the ideas of Thales, no longer considering the earth as a disc resting upon the waters, the potency of moisture or of water was still clearly visible in his system. His ideas of the origin of living creatures, as chronicled by Theophrastus,<sup>4</sup> are as follows: "Living creatures arose from the moist element as it was evaporated by the sun. Man was like another animal, namely, a fish, in the beginning." Hipp. Ref., i, 6 (R. P., 16 a).

"The first living creatures were produced in the moist element, and were covered with prickly integuments. As time went on they came out upon the drier part, and, the integument soon breaking off, they changed their manner of life." Aet.=Plac., v, 19. 1 (R. P., ib.).

"The sea is what is left of the original moisture. The fire has dried up most of it and turned the rest salt by scorching it." Aet.=Plac., iii, 16. 1 (R. P., 14 c).

*Anaximenes* (588 B. C.) appears at first sight to have taken a different element from any of his predecessors as the one underlying substances from which all things come. According to the account given by Theophrastus "from it . . . (air) . . . the things that are, and have been, and shall be, the gods and things divine, took their rise, while other things came from its offspring." Hipp. Ref., i, 7 (R. P., 21).<sup>5</sup> Burnet explains, however, that "the 'air' of which Anaximenes spoke was not at all what we call by that name. The word *ἀήρ* is still used in its old Homeric sense of vapor or mist. The discovery that what we call air was corporeal, and not identical with empty space, was first made by Empedokles. In all the earlier

<sup>1</sup> J. Burnet: Early Greek Philosophy, p. 45.

<sup>2</sup> Quoted by J. Burnet from Aristotle's Phys., Early Greek Philosophy, p. 51.

<sup>3</sup> J. Burnet: Early Greek Philosophy, p. 61.

<sup>4</sup> These references quoted by J. Burnet, Early Greek Phil., pp. 73-94.

<sup>5</sup> Loc. cit., p. 77.

cosmologists *ἀήρ* means water in a vaporous state more or less condensed."<sup>1</sup>

Below are quoted several passages of the *opinions* of Theophrastus which give the key to the cosmology of Anaximenes. "When it is dilated so as to become rarer, it becomes fire; while winds on the other hand are condensed air. Cloud is formed from Air by 'felting,' and this, still further condensed, becomes water. Water, condensed still more, turns to earth; and when condensed as much as it can be, to stones." Hipp. *Ref.*, Aet. (R. P., 21).<sup>2</sup>

Thus we see Anaximenes practically returning the view of Thales, making everything come from the *ἀήρ* or moisture, and even holding that the disc-shaped earth floated upon it.

*Xenophanes*, though not making himself clear concerning his cosmological theories, seems to incline largely to the Anaximandrian view. Though he denied the conception of a primary substance<sup>3</sup> he says:

"All things are earth and water that come into being and grow."<sup>4</sup> R. P., 86.

"For we all arise from earth and water." R. P., 86.<sup>5</sup>

*Heracleitus* (504 B. C.), not satisfied with former cosmology sought a new principle, out of which the diversified world might be made, which would change into everything else, and which would be produced by everything changing back into it. This he thought he found in "fire—real fire, of course, 'that burns and crackles,' as Teichmüller put it."<sup>6</sup> Many interpreters, however, regard this fire as only symbolic, and claim that the word was used with the same significance as Anaximenes had used air, that is meaning mist or moisture.<sup>7</sup> Be this as it may, Heracleitus regarded fire, water and earth, as the fundamental forms which water assumed in its transformation<sup>8</sup> in his celebrated "flux" theory gives to water great prominence.

Theophrastus records that "he called change the upward and the downward path, and held that the world goes on according to this. When fire is condensed it becomes moist, and when collected together it turns to water; water being congealed turns to earth (the conjecture of Theophrastus); and this he calls the downward path. And, again, the earth is in turn

<sup>1</sup> *Loc. cit.*, p. 78.

<sup>2</sup> *Loc. cit.*, p. 81.

<sup>3</sup> *Loc. cit.*, p. 124.

<sup>4</sup> *Loc. cit.*, p. 115.

<sup>5</sup> *Ibid.*

<sup>6</sup> *Op. cit.*, p. 148.

<sup>7</sup> *Op. cit.*, p. 148 for discussion of interpretation; also Zeller, *Pre-Socratic Philosophy*, II, 51 ff.

<sup>8</sup> Zeller: *Pre-Socratic Philosophy*, II, 51.

liquified, and from it water arises, and from that everything else; for he refers almost everything to the evaporation from the sea. This is the path upwards."<sup>1</sup> R. P., 29.

From Hippolytas, who probably represents Heraclitus accurately, in Mr. Bywater's edition we learn that Heraclitus believed that "the transformations of Fire are, first of all sea (and half of the sea is earth, half fiery storm-cloud)". R. P., 28 b.<sup>2</sup>

"The earth is liquified, and the sea is measured by the same tale as before it became earth."<sup>3</sup> R. P., 31.

Heraclitus believed that there was a constant flux between fire and water. One prevailed for a time, then the other, but that neither gained the permanent ascendancy. The balance was maintained by the "measures," as he called them. Measures of "ever-living fire" were ever going out; while compensatory "measures" were being kindled.<sup>3</sup> He writes, "so long as things as they are, fire and water will always be too, and neither will ever fail." Ps. Hipp., *De Diaeta*, i, 3.<sup>4</sup>

By the oscillation between fire and water Heraclitus explained the change of seasons, and day and night. Like the heavenly bodies man, also, oscillates between fire and water.<sup>5</sup>

Hippolytas interprets Heraclitus as saying :

"The dry soul is the wisest and best."<sup>6</sup> R. P., 34.

"For it is death to souls to become water, and death to water to become earth. But water comes from earth; and from water soul."<sup>4</sup> R. P., 30 B.

"It is pleasure to souls to become moist."<sup>4</sup> R. P., 38 b.

"A man, when he gets drunk, is led by a beardless lad, knowing not where he steps, having his soul moist."<sup>4</sup> R. P., 34.

*Empedocles* held that there were four fundamental and primary elements, fire, earth, air and water.<sup>7</sup> According to him plants and animals are composed of fire and water in definite proportions. Likewise man sprang from the earth, at first composed of shapeless lumps of earth and water, thrown up by subterranean fire, which gradually shaped themselves into human members under the influence of Love.<sup>8</sup>

*Anaxagoras* followed in a large measure the cosmological doctrines of Anaximenes. He taught that plants and animals all originated in germs which came down in rain-water.<sup>9</sup>

<sup>1</sup> Burnet: *op. cit.*, p. 151.

<sup>2</sup> Burnet: *op. cit.*, p. 135.

<sup>3</sup> Fragment 20. Quoted by Burnet, *op. cit.*, p. 135.

<sup>4</sup> Burnet: *op. cit.*, p. 135.

<sup>5</sup> Burnet: *op. cit.*, p. 162.

<sup>6</sup> Burnet: *op. cit.*, p. 138.

<sup>7</sup> Zeller: *Pre-Socratic Philosophy*, II, p. 125, *et seq.*

<sup>8</sup> Zeller: *op. cit.*, pp. 159-161.

<sup>9</sup> Zeller: *op. cit.*, p. 365.

These cosmological theories, trivial as they may now appear, were of the utmost significance. Who would for a moment question the great importance of the atomic doctrine of elements? Probably no other hypothesis in ancient or modern times has been so potent in determining our knowledge of the physical universe. Now, in all these crude attempts to answer the question proposed by Thales, we can distinctly foresee the struggles toward, if indeed not the germs of, a future atomic theory. They were searching for the primitive, fundamental, unchangeable something from which all else was derived. "Greek philosophy began as it ended, for what was lasting and abiding in the flux of things."<sup>1</sup> Thales postulated water as this abiding something, Anaximenes *ἀήρ* or mist, Heraclitus fire, which, however, could not exist without water, Empedocles, earth, air, fire and water. Others asserted one or a combination, but in all these theories water played the chief, or at least not unimportant rôle in answering Thales' conundrum.

#### SACRED WATERS.

We have shown how water came to be regarded as possessed of life-giving powers through its connection with the growth of vegetation. Living or running water came to be regarded as of special sanctity. Early civilizations largely inhabited countries having periodic rainfalls, so that with the rainy season and overflowing streams, the apparent visitation of some supernatural powers were particularly noticeable. Gradually certain streams, lakes, pools, wells and fountains, became set apart as sacred. The sources of streams were held as particularly sacred. Temples and other sanctuaries were frequently erected on the banks of streams, and the stream formed an important part of the *sacra* of the place.

We have evidence of the sacredness of many rivers in the Orient. The Phœnecians and the Carthaginians held many rivers to be divine. Belus, Adonis, Æsclepius and the Kishon, were all held in veneration; also the pool of Aphaca, which was the most famous of all holy places. Several of these holy places were named from the ancestral gods. The river Tripolis is still called the Cadisha, or holy stream. The Jordan, in Biblical times, was the sacred stream of the Hebrews, as were the Abana and Pharpar of the Syrians. In Damascus the Barada was sacred, and figures of the river-gods Chrysorrhoa and Pegai often appear on Damascene coins. These gods were probably prominent in religious worship. The Euphrates was sacred to the Syrians, and bore an important part in the ritual of Hierapolis. From the river the goddess was thought to have

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<sup>1</sup> Burnet: *Early Greek Phil.*, p. 13.

been born. The Aborrhas or Chaboras, the chief tributary of the Euphrates in Mesopotamia, was held sacred as the place where Hera (Atargatis) bathed after her marriage with Zeus (Bel). According to tradition the Orontes was carved out by a dragon which disappeared in the earth at its source. The river Cadas bears a name which implies its ancient sanctity.

Besides sacred streams, fountains, waterfalls, wells, pools, etc., were regarded sacred. Each village in Syria had its own well and its own high-place or little temple. In Canaan they were generally outside of the villages. Sacred springs were generally sought in places to which long pilgrimages had to be made. Such shrines were Mamre, Aphaca, Dan and Beersheba. Sometimes they were within the temples, and again, as at Antioch, the water and the groves surrounding formed public parks where pleasure and religious observances were combined.

Both legend and religious ritual give evidence that, at least in earliest times, the sacred waters themselves were deemed instinct with divine powers, and not that beings resided in them which possessed these magic gifts. The latter idea came in, but it is not the primitive one. Many of the legends attempt to explain how the waters became impregnated with supernatural powers. Many ancient accounts seem to indicate that the blood of the deity flows in the waters. In *Paradise Lost*, following Lucien in the Syrian account,

" Smooth Adonis from his native rock,  
Ran purple to the sea, supposed with blood  
Of Thamuz yearly wounded."<sup>1</sup>

The red color of the river was supposed to come from the blood of the god killed. A fountain at Joppa was said to be colored from the blood of a sea-monster. In another class of legends the life of the water is derived from the blood of the gods who descend into them and die. This was said of the Euphrates, into which Hierapolis and Ascalon plunged and were changed into fishes. This, says Mr. Smith, is but another way of bringing the divine water or divine fish into harmony with anthromorphic ideas. Aphrodite is said to have been born of the seafoam, which is but another way of saying that a deity had given its life to the water. Fish were taboo in Syria, and sacred fish were found in all sanctuaries. Sacred fish are still kept in pools at the mosques of Edema and Tripolis.

The early inhabitants of Switzerland probably worshipped the lakes. Ancient writers indicate that the Gauls, Germans and other nations, considered many lakes sacred. "According to Cicero, Justin and Strabo, there was a lake near Toulouse in which the neighboring tribes used to deposit offerings of gold

<sup>1</sup> *Paradise Lost*, I, 450, following Lucien in *Dea Syria*, viii.

and silver. Tacitus, Pliny and Virgil, also mention the existence of sacred lakes."<sup>1</sup> Gregory of Tours tells of a sacred lake on Mt. Helamus which was worshipped, and offerings of clothes, skins, etc., made to it.

Besides being sacred many of these waters were deemed to possess life-giving powers to all who drank of them or bathed in them. It was but an extension of the notion concerning the relation of rain and water in general upon vegetation to its effects upon man. Stories of fountains of youth abound in all lands, and the significance is great. It betokens the widespread faith that has been held concerning water as a life-giving agent, and the close identification of water with life. The magic draught of the fairy story, the Greek ambrosia, the Vedic Soma or amrita, which gave immortality, the Zend haoma, waters of strength and waters of weakness, rivers of life and fountains of youth, all seem intimately connected through the primitive notions from which they all arose. These draughts were the source of all strength and powers, panaceas for all ills. By imbibing magic waters, or bathing in them the old were made young, the infirm strong, and the blind to see.

In India there is a lake and river in which bathers could become as young or as old as they chose. Cambyses had heard of the long-lived Ethiopians, and despatched messengers to spy out their conditions of life. The Ethiopians were reported to live a hundred and twenty years, and the secret was that they bathed in a magic fountain. In the Hawaiian legend Tahita Kahiki, or the land *far away* may be found the *wai ora waiola*, or water of life, and the *wai ora roa*, or water of enduring life. These waters remove all sickness, deformity, or decrepitude from those who plunge beneath them.<sup>1</sup> The Sandwich Islanders have a tradition of a river in the spirit-world called Water of Life, which makes the aged young, and allows them to return to earth to live another life. Similar ideas have been found in the Malay Islands. Batara Gurr saves himself and the other gods from a poisonous drink by discovering a well of life. Nurtjaja compels the bandit Kabib to disclose to him the springs of immortality which flow beneath the caverns of the earth. Europe is not lacking in stories of miraculous fountains. "Ibu-el-Wardi places the Fountain of Life in the dark southwestern regions of the earth. El-Khidar drank of it, and will live till the day of judgment." Prester John wrote to Manuel of Constantinople in the 13th century that "at the foot of Mount Olympus bubbles up a spring which changes its flavor hourly day and night, and the spring is scarcely three days journey from Paradise, out of which Adam was driven. If any

<sup>1</sup> Sir John Lubbock : Pre-Historic Times, p. 222.

man drinks thrice from this spring he will from that day feel no infirmity, and he will as long as he lives appear the age of thirty.<sup>1</sup> Sir John Maundeville is said to have identified the mountain a century later as Polombo, near Ceylon. (Tylor gives it as Mt. Cytec.) He wrote that there "is a fayre Welle and a gret that hathe odour and savour of all Spices; and at every hour of the day he changethe his odour and his savour diversely. And whoso drynkethe 3 tymes fasting of the Waters of that Welle, he is hool of alle maner of sykenesse that he hathe. . . . And men seyn, that that Welle cometh out of Paradys; and therefore it is vertuouus."<sup>1</sup>

During the Middle Ages the belief was current that one who bathed in the Euphrates in the springtime would be immune from disease the remainder of the year. This power also extended to the vegetation along its banks. Near the sacred Belus grew the colcasium plant which healed Heracles after his combat with the Hydra. Ezekiel speaks of the sacred waters that issue from the New Jerusalem, giving life wherever they went. The leaves of the trees along its banks were believed to have medicinal virtues. The fountain of youth was a much sought for object even in subsequent times. Ponce de Leon is said to have searched long and anxiously for it among the Bahamas, and the everglades of Florida, and even penetrated the New World as far as the Mississippi River in search of that which would rejuvenate his ebbing powers.

*Healing Waters.* Belief in the curative and even life-giving powers of certain water has persisted down to the present time. "The healing power of sacred water is closely connected with its purifying and consecrating power, for the primary conception of uncleanness is that of some dangerous infection; originally an infection of holiness, but later on of impurity."<sup>2</sup> (Studied more in detail later on.) There are numerous records of enchanted wells until recently, and possibly still regarded as possessing miraculous powers. Great Britain, Scotland and Ireland, furnish them in great numbers. Among the most noted was St. Winifred's in Flintshire, Wales. Its waters were deemed almost as potent as those of the pools of Bethesda. All human ills were supposed to be relieved by drinking from it or being bathed in it. The spot from whence the spring issues is the spot upon which St. Winifred's head fell when struck off by Prince Caradoc. It has many visitors to this day. In 1635 Sir George Peckham prolonged his devotions too far, "having continued so long mumbling his *paternosters* and *Sancta Wini-*

<sup>1</sup> W. Robertson Smith : Rel. of the Semites.

<sup>2</sup> W. Robertson Smith : Rel. of the Semites, p. 68.

*freda oreā pro me*, the cold struck into his body, and after his coming forth from that well he never spoke more."<sup>1</sup>

Hither came Wm. the Conqueror, his grandson, Henry II, and the first Edward; here, too, many of the Gunpowder Plot conspirators, and later James II. In 1876 the Duke of Westminster leased the well to the corporation of Holywell for a thousand years at a sovereign a year. At a recent date the following articles left by cured patients might have been seen by the curious visitor: 39 crutches, 6 canes, a hand-hearse, and a pair of boots. It is said of the two wells at Newton, near St. Neots, that "never went people so fast from church, either unto a fair or market, as they go to these wells."<sup>2</sup> In the parish of Wembdon, during the reign of Edward IV, immense concourses of people flocked to St. John's Well, and were said to be restored to health through its curative properties. With Chader Well, on the Island of St. Lewis, and also a well in Dumfriesshire it was either kill or cure: if convalescence did not immediately follow, death did.

Sacred wells were often the mediators in the transference of disease. At St. Elias's Well, Denbighshire, disease is transferred by casting into the well a pin, along with a pebble, marked with the intended victim's name. If the victim hears of it disease often occurs as a result of suggestion, but believed to have been transferred by magic. To remove the disease, the pebble is taken out and the victim's name erased from the magician's book.<sup>2</sup> At the holy well, Tubber Quan, near Carrick on Suir, the faithful were, and probably are, wont to resort on the last Sunday in June to supplicate St. Quam and St. Brogaum. If cures are to be granted they appear as two wonderful trout. In Wales epileptic patients go to St. Telga's Well, half way between Wrexham and Ruthin. The patient goes to the well after sunset, washes in it, and makes an offering of four pence. With a fowl under his arm he walks around the well three times, reciting the Lord's Prayer. He then sleeps all night in the church with the Bible for his pillow. In the morning another six-penny offering is made to the well. If the fowl dies the disease is supposed to be transferred.<sup>3</sup>

A few years ago a lady was sketching on the banks of a river in Ireland when she "saw a young girl . . . leading a boy with a halter round his neck. When the pair reached the river the boy went down on his hands and knees, and so led by the girl crossed the river, bending his lips to drink. They then recrossed in the same fashion; he drank as before and she led. Then they went up the hill home. But presently

<sup>1</sup> W. G. Black: *Folk Medicine*, p. 103.

<sup>2</sup> W. G. Black: *Folk Medicine*, p. 39.

<sup>3</sup> *Loc. cit.*, p. 46.

they again appeared coming down the hill. This time, however, the boy led the girl, otherwise the ceremony was the same. 'Me an' Tom's very bad with the mumps,' explained the little girl, raising her hands to her swollen neck and cheeks, 'so I put the branks on Tom an' took him to the water, an' then he put them on me. We be to do that three times an' its allowed to be a cure.' And a cure did result."<sup>1</sup> In the early part of the century sufferers from the whooping cough, Catholic and Protestant, drank holy-water from a silver chalice in the hope of a cure. Nurses in Gloucestershire used invariably after public baptism to wash the infant's mouth with the holy water. It was said to be a safeguard against toothache. Such a value was placed upon this water that to prevent the people stealing it, the fonts had to be kept locked. In the Puritan portion of western Scotland it was looked upon as having power to cure many disorders. Further, it was a preventive against witchcraft, and eyes bathed in it would never behold ghosts.<sup>2</sup> It is said of the Borgie Well, at Cambuslang, near Glasgow :

"A drink of the Borgie, a bite of the weed,  
Sets a' the Cam'slang folk wrang in the head."

On the 26th of June, every year, people flock to Saw Beach, Maine, for a healing dip which the waters are thought to provide on that day.

The Chinese do not like to have running water near their dwellings because it runs away with their luck. Scotch and English peasants believe it will bear away evil, and thus attach great value to it. Some think that to possess desirable qualities the stream must run east, others think south. The latter is usually regarded the more auspicious, being particularly efficacious in cure of witchcraft, a series of three mighty plunges being required for a cure. In Northumberland whooping-cough was cured by porridge cooked on a griddle held over a south-running stream. At one time the number of patients was so large that they could get but a spoonful at a dose.

*Offerings.* A further proof that the divine potency was supposed to reside in the water is shown by the form of religious ceremonies observed when offerings were made to the water. At Mecca and at the Stygian waters in the Syrian desert gifts were cast into the holy sources. Even at Aphacus, where the goddess Astarte was believed to descend into the waters, the pilgrims cast into the pool webs of linen and byssus, gold and

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<sup>1</sup>J. G. Black : *Folk Medicine*, pp. 105-6, from *Univ. Mag.*, Aug. 1879, p. 219.

<sup>2</sup>J. G. Black : *op. cit.*

silver jewels and other valuable materials. At Abraham's Well, Mamre, the heathen visitors cast into it libations of wine, cakes, coins, myrrh and incense, and illuminated the well at night with lamps.<sup>1</sup>

The custom of leaving rags and other worthless things at holy wells still exists in Ireland and Scotland as well as in remote parts of the world. A traveller in Persia found a tree near one of these wells hung with rags, which had been left there by people afflicted with ague. An African explorer found a tree hung full of rags. Old clothes, crooked pins, pebbles, shells, rusty nails, coins and other useless objects, all form appropriate offerings. The superstitious adoration was so great in the reign of King Edgar that it was forbidden by the 16th canon issued in 960, and it was condemned by the canons of St. Anslemus in the next century. In the reign of King Canute it was also interdicted by law. The practice has been limited since the Reformation. But there is still scarcely a parish in Ireland but has its own holy well.<sup>2</sup>

*Oracular Powers.* Holy waters have often been places of oracle and divination. They were supposed to indicate by some sign the favorable or unfavorable disposition of the divine power, and also to show whether certain gifts were acceptable or not. At Aphaca acceptable offerings sank, and unacceptable ones were thrown back by the eddies. The gifts deposited one year were thrown back the next, which was regarded as an ill omen, betokening the fall of Palmyra. In Greece holy wells gave prophetic inspiration to those who imbibed their waters. The oracle at Antioch was obtained by dipping a laurel leaf into the water. The oracular power of water has often been used to determine the curability or incurability of disease. In recent times it was customary at St. Orwald's Well, Holywell Dale in North Lincolnshire, Great Cotes, St. John's Well, Aghada, Cork and at other places, for people to try to discover by the floating or sinking of their shirt, whether one would recover or not. At their departure they usually hung a part of their shirt or a rag upon a bush near by as an offering.<sup>3</sup> One form of oracular manifestation is seen in the ordeals such as those used in trial of witches, which survived until recent times. In 1759 King James I published his [in] famous treatise on demonology. One of the methods prescribed for testing witches and sorcerers was to find an anæsthetic or analgesic spot on the body of a person, which was an indication of league

<sup>1</sup> W. Robertson Smith: *Rel. of the Semites*, p. 162.

<sup>2</sup> Gabrielle M. Jacobs, in *Godey's Magazine*, Feb., 1898; see also Brand's *Popular Antiquities*, Vol. II, for interesting chapter on sacred wells and fountains.

<sup>3</sup> W. G. Black: *Folk Medicine*, p. 73.

with the devil. The other was the trial by water. He wrote: "it appears that God hath appointed (for a supernatural sign of the monstrous impiety of witches) that the water shall refuse to receive them in her bosom that have shaken off them the sacred waters of baptism and willfully refused the benefit thereof."<sup>1</sup> In Hadramant when a man was injured by enchantment, all the suspected witches were brought to the sea or a deep pool, weights were tied to them, and they were thrown into the water. Those who sank were adjudged immune, while those who did not sink were declared guilty because the waters rejected them.<sup>2</sup>

In ancient religions it was criminal for persons ceremonially impure to approach sacred waters. Arabian women during menstrual periods were forbidden, for their children's sake, to bathe in the Dusares. At the present no one dares enter the valley of the Sheik Adi, which has a sacred fountain, without first ceremonial purification of person and clothing. Aristotle described a sacred oil-spring of the Carthaginians which would flow only for those ceremonially pure. Drinking certain water was often prescribed as an ordeal. The waters of Asbamæ, near Tyana, were sweet and beneficial to those who were truthful, but perjurers were at once afflicted with dropsy and wasting. Those who swore falsely by the Stygian waters died of dropsy within the year.<sup>3</sup> The Hebrews prescribed the drinking of holy water for women suspected of infidelity to their husbands. The guilty were immediately afflicted with dropsy on drinking it.

Many superstitions are still current regarding the supernatural power of water to bring harm to offenders. Sayings and proverbs are also prevalent which, though not now believed, represent actual beliefs of more primitive times. One of the oldest superstitions regarded it as certain that ill would befall the rescuer of a drowning person. The older form of the superstition maintained that the rescuer would himself be drowned. In this primitive conception it was believed that the water was a spirit, or contained a spirit or nixy who was naturally angry at being deprived of his victim, and who would revenge himself by drowning the one who tried to thwart him.<sup>4</sup>

To dream of deep or muddy water is regarded as a sign of trouble. Dripping water is a sign of death. It is lucky to have rain fall on a corpse or an open coffin. To cross water cures disease. A stormy wedding day betokens a stormy life. Several in my syllabus returns speak of superstitions concerning water that have affected their own or others' actions. An old

<sup>1</sup> Quoted by Baros Sidis: *The Psych. of Suggestion*, pp. 336-7.

<sup>2</sup> W. Robertson Smith: *The Rel. of the Semites*, p. 163.

<sup>3</sup> *Op. cit.*, pp. 163-4.

<sup>4</sup> J. Fiske: *Myths and Mythmakers*, p. 215.

man going to the beach met a girl and happened to brush against her. He was drowned that day, and the girl was much frightened lest the same fate should befall her. She was heard to remark that she must be careful and not go out too far when she went bathing or she would surely drown. A man in Sweden besought his brother not to cross a certain lake because some one was sure to drown there within twenty-four hours.

F., 41. About a year ago I experienced a great trouble. The following day it rained very hard. Seemed as if nature were weeping with me.

F., 18. My mother and another lady both dreamed on three different nights that I was in my canoe and was drowned. At the time the "flood gates" at Park Island were in a dangerous condition. My mother and her friend were sure I would be drowned, but the gates have been repaired, and I am still alive.

Fishers folk are very superstitious, and regulate most of their lives according to superstitious beliefs connected with the sea. Birth and death are dominated by the ebb and flow of the tide. This is illustrated by Dickens<sup>1</sup> in referring to the death of Barkis. "People can't die along the coast," said Mr. Peggotty, 'except when the tide's pretty near out. They can't be born unless its pretty nigh in—not properly born, till flood. He's a goin' out with the tide. Its ebb at half arter three, slack water half-an-hour. If he lives till it turn, he'll hold his own till past the flood, and go out with the next tide,' . . . and it being low water he went out with the tide."

#### WATER DEITIES.

Folk-tales and mythology of all lands abound with accounts of spirits who inhabit the water. They are a product of the universal animistic conception of the primitive minds which, failing to differentiate the non-ego from the ego, personify whatever happens to be an object of contemplation. "To the lower tribes of man, sun and stars, trees and rivers, winds and clouds, become personal animate creatures, leading lives conformed to human or animal analogies, and performing their special functions in the universe, with the aid of limbs like beasts, or of artificial instruments like men."<sup>2</sup> Water with its ceaseless motion and constantly varying shapes offered wide scope for the savage imagination.

Proteus, the old man who tends the seal of Poseidon, lived near the river Aigyptos, and each day, when the heat was greatest, he raised himself from the deep and rested on the sea-

<sup>1</sup> David Copperfield : Gadshill Ed., Vol. II, p. 10.

<sup>2</sup> E. B. Tylor : Primitive Culture, I, p. 285.

shore. He first became fire, then a snake, and finally assumed many aspects before returning to his original shape. He is said to be the Farmer Weatherby of Norse tales. The daughters of Nereus are the Nereids or Naiads, denoting water dwellers. The word Nereid is usually applied to those living in the sea,<sup>1</sup> and the latter to those inhabiting fresh water. The Greek goddesses, Nymphê or Latin Lymphæ, belong to the water. Lymphaticus, of Latin origin, corresponding to Nympholeptos, denoted the man smitten by the Nymphs. The Nymphê were sometimes divided into the Oreads and Dryads. In the Vedas they are the Apsaras or movers in the waters, and are endowed with wisdom. Besides the Nymphê there were the swan-maidens of Aryan mythology, who were akin to clouds and vapors. They swam about on seas formed by the blue heavens, and navigated by the self-guided barks of the Phakians. Thetis, although called a Nereid, is akin to Proteus, and can change her form at will. Poseidou is lord of the Thalassa or troubled waters. Okeianos, whose slow-moving stream no storm can ruffle, dwells in the far west. He is the source of all things. "From him flow all rivers and all the tossing of floods, all fountains and all wells. He is, in short, the spring of all existence."<sup>2</sup> Neptune is not strictly a god of the sea, but "the god of the clouds as the source of all moisture and water."<sup>3</sup> The Sirens are the witches of the shoals, while Scylla and Charybdis are the demons of the whirlpools. These are universally known, though under different names. Father Marquette met with the same belief among North American Indians with reference to a river whirlpool.

In Australia special water demons infest pools and bathing places. In the natives' theory of disease and death no personage is more prominent than the water spirit, who afflicts all who go into unlawful pools or bathe at unlawful times. The Greenlanders preserve animistic ideas concerning water. When they come to an untried spring an Angekok, or the oldest man, must drink first to free it from a harmful spirit. The Algonquin hunter says, "the spirit, he maketh this river flow." In all rivers, lakes or cascades, he believes there are spirits or mighty manitus. The Winnebagoes on reaching a body of water make a present or sacrifice to the spirits who reside there. The Peruvians used to scoop up a handful of water and drink it, praying the river deity to let them cross or to give them fish. Indians of the Cordilleras take a ceremonial sip before they will pass a river on horseback. Most African

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<sup>1</sup> G. W. Cox: *Mythology and Folk Lore*, pp. 202-4.

<sup>2</sup> G. W. Cox: *op. cit.*, p. 204.

<sup>3</sup> *Ibid.*

tribes display well the rites of water worship. Among the Manikas every spring has its spirit to which oblations are made. In the Okra district, lakes, ponds and rivers, are worshipped as local deities. The Kaffirs and Tartars venerate streams as personal beings, or as the abodes of personal deities. Water holds a very prominent position in Finnish mythology, and nothing in nature indicates a more supernatural origin. Many of the sayings are still beliefs. The people call themselves Suomilainen or fen-dwellers, since they live in a land of swamps and marshes. Vapor baths are a national characteristic. Many streams and lakes are called holy, and receive sacrificial tributes. They have a current superstition that rivers may resent being enslaved when a new mill is being constructed,<sup>1</sup> just as the Romans believed that the Tiber was offended when chained by a bridge. Their chief water-god, Ahto, lives with his cold and cruel-hearted spouse, Wellamo, at the bottom of the sea. The general term for inhabitants of the water is Ahtolaisset, which means water-people. Allotar is the wave-goddess, Koskenneiti the cataract maiden, Wellanos the eternal people or people of the foam and billows. In the Vedas the river is personified. Sometimes they are the good mothers who watch over and care for the people. They were believed to control the growth of vegetation and animals, and were addressed as gods who must be propitiated to retain good will.<sup>2</sup> Norse and Russian mythology are full of allusions of river-spirits. Matthew Arnold's Forsaken Merman is undoubtedly founded upon the Russian myth in which Russalka, the drowned girl, marries a Vodyamy or Merman. The rivers of Russia are thought to have been persons. In Iceland seals are regarded as descendants of the Pharaohs who perished in the Red Sea.<sup>3</sup> Thus we might trace the prevalence of water spirits in all countries,—in the remote Orient as well as the Occident.

Mr. Tylor says<sup>4</sup> that to the savage mind "water acted not by laws of force, but by life and will; that the water spirits of primeval mythology are as souls which cause the water's rush and rest, its kindness and its cruelty; that lastly man finds, in the beings which can work him such weal and woe, deities with a wider influence over his life, deities to be feared and loved, to be prayed to and praised and propitiated with sacrificial gifts."

*Paradise* has usually been conceived by primitive people as a land beyond the sea, or a place surrounded by water, which must

<sup>1</sup> Max Müller: Cont. to the Sci. of Myth., I, 269.

<sup>2</sup> Kalavala, the national Finnish epic.

<sup>3</sup> W. R. S. Ralston: The Songs of the Russian People, p. 148.

<sup>4</sup> Primitive Culture, II, 209.

be crossed at death. The belief in an earthly paradise existed for centuries. "The features of this earthly paradise are for the most part similar to those familiar to us in Biblical description. It contained the fountain of immortality, from which sprang the four rivers which flowed to the four quarters of the earth. Purling brooks ran with the far-famed ambrosia."<sup>1</sup> This garden of delight was often sought, but only those in league with the gods could find it. Nereus, the sea-god, succeeded in piloting Hercules to the spot.<sup>2</sup> A 14th century Icelandic saga describes the position of the Deathless Land as across a strait which was to be entered by a stone bridge, guarded by a dragon. In Japanese legend there exists an Island of Eternal Youth.<sup>3</sup> It is beyond the horizon, and some fortunate observers have seen a wonderful tree rising far above the waves. The tradition was slow to die, and there are probably people who still believe, as did Sir John Maundeville in the 14th century, that the Garden of Eden exists somewhere upon the earth if it could only be found. After describing its cosmogenic position he relates that "in the highest place of Paradise, exactly in the middle, is a well that casts out four streams," the first is called the Ganges, the second the Nile, the third the Tigris, and the fourth the Euphrates. "And men beyond say that all the sweet waters of the world, above and beneath, take their beginning from the Well of Paradise, and out of that well the waters come and go."<sup>4</sup>

*Rivers of Death.* The "land of the blessed" is, as we have noted, quite universally separated from the abode of mortals by some body of water, now by a gulf, now the stormy sea, or again by a river which must be passed beyond the grave. The idea is preserved among all civilized people in sacred worship, by scripture and hymnology. The land of promise is quite universally across the "River of Jordan" or similar waters. Stories of "rivers of death" and "bridges of the dead" are to be met with in all tongues. The rivers Styx and Lethe have come down in our language as symbolic of death. There is a large quantity of Polynesian mythology relating to the gulf of death, though the bridge conception is lacking. Souls are obliged to cross this gulf in canoes or by swimming. In the ancient Orient the Vedic Yama, King of the Dead, crossed the rapid waters to guide our Aryan ancestors. The modern Hindoo is supposed to grasp the cow's tail when death comes, and is thus safely ferried over the dreaded river Vatarini. In ancient Egypt and modern Brittany Charon carried in his boat the

<sup>1</sup> Mrs. J. H. Philpot: *The Sacred Tree*, p. 136.

<sup>2</sup> *Loc. cit.*

<sup>3</sup> *Op. cit.*, p. 141.

<sup>4</sup> *Travels in Early Palestine*, p. 276.

procession of the dead to their long home. The ancient Scandinavians used to place their distinguished heroes in a ship, set it on fire and cast it afloat, or bury them in boats on shore.<sup>1</sup> The Finns, the Guinea Negroes, the Khonds of Orissa, and the Dyaks of Borneo, all have myths relating to rivers of death. Some North American Indians have tales of the bridge of the dead, but more frequently the water must be crossed in canoes to reach the "beautiful island." A storm always wrecks the wicked souls, and the heaps of their bones are to be seen under water as evidence of the fact. The Ojibwas are obliged to cross the Heaven Gulf on the way to the "land of spirits," and the wicked are drowned by their burden of sins.<sup>2</sup> Not even ghosts will cross living water. Witches, also, cannot do so, as we know in the case of Tam O'Shanter, they were baffled when he reached the Bridge o' Doon. Sometimes the milky-way and the rainbow are called the bridge of souls.<sup>3</sup> That the soul after death has a perilous journey is believed by many people. The Algonquins believed that the wicked perished in crossing the lake to the happy land. The Choctaws are said to walk a peeled log, and the wicked slip off into the boiling gulf. The Moslem's bridge of Es-Sirat was sharper than a knife-edge. The Australian natives, who are without an idea of God, believe that their souls after death fly to the clouds or cross the ocean to a distant land. Finns believed that those journeying to Tuonella were required to voyage over nine seas and over one river, the Finnish Styx, black, deep, and filled with hungry whirlpools and angry waterfalls.

There is great tenacity in old impressions, especially when connected with the sanctity of religious doctrines and feelings. The primitive beliefs relating to the location of paradise, the river or gulf separating it from the present, and the difficulty of passing this water still survive in poetry and hymnology. From a few hymn books I have collected nearly two hundred different phrases and lines relating to rivers of life, fountains of life, healing waters, havens of rest, crossing wild and stormy billows, shore beyond the river, etc. (See sec. on Water in Literature.)

Many curious customs have arisen as a result of the belief in rivers of death. Various ways of aiding the departed on their journey have been invented. The custom of placing a coin in the hand of the corpse with which to pay the boatman who ferries them across the river is still found among Scandinavians, the peasants at Altmarkt, Germany, and among some

<sup>1</sup> John Fiske: *Myths and Mythmakers*, p. 49; also Thalma, by Marie Corelli.

<sup>2</sup> E. B. Tylor: *Early Hist. of Manhood*, p. 362.

<sup>3</sup> John Fiske: *Myths and Mythmakers*, p. 57.

Irish at wakes, and among peasants in Cleveland, England. Some Hebrews in America are said to place a towel and soap with the corpse for use in crossing the river. In Brittany is the Baie des Ames (Bay of Souls), where souls are said to be launched for their voyage.

*Water Itself Animate.* Bearing in mind these early conceptions of primitive peoples regarding the supernatural powers and animation of water, it is not difficult to conceive how certain waters came to be sacred, while all folk-tales and mythology abound with accounts of waters of life, waters of strength, waters of weakness, etc. Nor will it be difficult to understand how by a slight extension of the idea of the supernatural power of living water came the conception of ceremonial renewal of life. Water was early ascribed as the dwelling-place of the gods, which is evidenced by survivals in the mythology of all countries. Mythology and folk-tales of all peoples abound with stories of nymphs, water-gods and goddesses, that reside in the waters. But evidence shows us that the more primitive conception regarded water itself as endowed with life. All nature suggests to the savage mind the conception of living force, and primarily supernatural life belongs to the objects themselves. W. Robertson Smith says of the Semites<sup>1</sup> "that the supernatural was conceived in a generally savage fashion, and identified with the quasi-human life ascribed to the various species of animals or plants, or even of inorganic things. For, indeed, certain phenomena of inorganic nature directly suggest to the primitive mind the idea of a living agent. . . . Of all inanimate things that which has the best marked supernatural associations among the Semites is flowing, or as the Hebrews say, 'living water.' In one of the oldest fragments of Hebrew poetry the fountain is addressed as a living being"<sup>2</sup> (Num. XXI, 17-18.) We have previously noticed that water was conceived among many primitive peoples as being the source of all life to vegetation, and was also supposed to possess the power of restoring the dead to future life. These ideas, coupled with the knowledge of the function played by drinking water and, also, the fact that bathing refreshes and invigorates, led naturally to the belief that water externally applied produces magical changes in human life. From these early beliefs and superstitions, the religious and legal ceremonial bathings, the precursor of later baptismal rites arose.

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<sup>1</sup> Rel. of the Semites, p. 126.

<sup>2</sup> Rel. of the Semites, p. 127.

## LUSTRATIONS AND CEREMONIAL PURIFICATIONS BY WATER.

Many writers ascribe to ceremonial purifications an origin purely purgative in character, but we shall see that the idea of a supernatural virtue inherent in the water is the most prominent and original feature instigating the ceremonies. The usual medium employed in lustrations is water, though sometimes other substances, as sand or salt, were used in default of water. But undoubtedly in these cases, also, the agent was believed to possess more than simple cleansing properties. Salt, we are certain, was regarded as sacred by many primitive peoples.

One writer<sup>1</sup> has suggested in accounting for the ceremonial of Christian baptism that John the Baptist simply utilized an observance largely in vogue in Oriental countries. This is undoubtedly true of Christian baptism, but the idea that ceremonial purifications, prior to this time, arose owing to the dust and heat making cleanliness and comfort demand very frequent bathing of the whole body, is not tenable. This custom may have been prevalent in that country, and in that advanced stage of civilization found by John the Baptist, but ceremonial purifications and lustrations date back to remoter times, and are found among the most primitive peoples of to-day. Though the idea of cleansing is found in some or perhaps most of the ceremonials, yet many circumstances indicate other ideas connected with their origin. Certainly the idea of bodily cleansing is very remote among some of the most ardent disciples. Tylor states<sup>2</sup> that "these ceremonial practices have come to mean something distinct from mere cleanliness. Kaffirs who will purify themselves from *ceremonial* uncleanness by washing, are not in the habit of washing themselves or their vessels for ordinary purposes, and the dogs and the cockroaches divide between them the duty of cleaning out the milk baskets.

I believe, however, that instead of "coming to mean" as Dr. Tylor interprets it, that the ceremonials always have been only partially indicative of either literally cleansing bodily uncleanness or symbolizing purification from spiritual contamination. This meaning has been read into the facts in the light of modern baptism. But the older idea considered that the fetish could in some magic way renew, revive, rejuvenate, or even remove undesirable qualities. There was a belief in some inherent sacredness and magic power of the medium itself with little or no thought of the literal cleansing properties. From time immemorial the Ganges has been held sacred. Whoever bathed in it was cleansed and rejuvenated. The new-born babe

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<sup>1</sup> A. W. Eaton: Heart of the Creeds, p. 135.

<sup>2</sup> Primitive Culture, p. 434.

is bathed in it, the sick sprinkled with its water, and the dead are plunged into it. It is carried to the Hindu houses and used in the temples. Now, were water symbolic of cleansing, only, any water would suffice. But it must be particular water, possessed of supernatural powers.

According to the legendary lore of the Greeks at the feast of Pales, the goddess of the flocks, shepherds purified themselves by washing in fresh dew, or by aspersion with consecrated water, sprinkled from a laurel or an olive branch.<sup>1</sup> The Scriptures record that 894 years B. C., Naaman was sent by Elisha to wash in the Jordan seven times to be cured of leprosy. After dipping himself seven times he came forth clean, with flesh like a little child. All these illustrate how, from the more primitive belief in the universal life-giving power of water, certain waters became set apart as sacred, and still possessed of curative powers and revivification. The symbolism of spiritual cleansing is plainly a later idea. The myths and legends of fountains of youth, waters of immortality, and later facts relating to sacred wells, rivers, etc., elsewhere described, corroborate this view.

Among all peoples ceremonial lustrations have been practiced long before baptismal rites, symbolic of spiritual cleansing were known. Long before the Christian era ceremonial purifications by water were common, and are also common among savage tribes at the present time who know nothing of baptism. Some savage tribes, it is true, know and practice baptism which they have learned from missionaries, but lustrations were known to them before the ceremony of baptism was learned. Sacred<sup>2</sup> and profane literature record that ceremonial purifications were to be observed after such occurrences as childbirth, theft, touching a corpse, adultery, the conjugal act, etc. Lustral water was placed at the doors of the Greek temples so that priests could purify the profane. Usually before entering a temple the hands and feet were washed. This was also true among the Hebrews.<sup>3</sup> The Hebrews were taught to regard running water as having greater power of purification than still water. The Incas of Peru to be purified from guilt bathed in the river and repeated the following: "O, thou River, receive the sins I have this day confessed unto the sun; carry them down to the sea, and let them never more appear."<sup>4</sup>

Among the Essenes and the Pharisees ceremonial bathing took up a great part of the time, so that it was very natural that John the Baptist should adopt that method of consecration in

<sup>1</sup> Baring Gould : *Origin and Derivation of Rel. Belief*, p. 398.

<sup>2</sup> Lev. XII, XV, etc.

<sup>3</sup> Ex. X, 29, 30, 40 ; Lev. 8, etc.

<sup>4</sup> Baring Gould : *Origin and Deriv. of Rel. Belief*, pp. 399-401.

Christ's time. It was simply making sacred a custom which had long been in vogue.

*Infant Baptism.* The lustration ceremonials for infants, prevalent among almost all primitive peoples, contain many suggestions that indicate belief in the magic power of water. In many cases these infant baptisms, as well as some of the ceremonials above noted, are for the purpose of removing *tapu* or *taboo* as well as cleansing. Among many tribes a new-born infant is taboo until ceremonial purification has removed the taboo. Some tribes do not baptize the infants until three or four months old. During this period the mother is also taboo. This does not refer to uncleanness in the ordinary sense of the term. The taboo may refer in some cases to physical uncleanness, but the more primitive conception is that the object of taboo is in some mysterious manner associated with dangers arising from the presence of supernatural spirits, which are to be avoided as one would avoid infectious diseases. All taboos are produced through awe of the supernatural. The new-born, as the woman in childbed, or during her courses, or the person who touches a corpse, are all taboo because everything connected with generation of the species, and also with disease and death seem to involve supernatural powers of a dangerous sort. There is a type of taboo arising out of respect to the gods, where certain holy things must not be touched, but it is not because of the offense given. On the contrary, it is because the taboo will sanctify whatever it touches, rendering it unfit for ordinary uses. For example, "a slave or other person not sacred would not enter a *wahi tapu*, or sacred place, without having first stripped off his clothes; for the clothes, having become sacred the instant the precincts of the *wahi tapu*, would ever after be useless to him in the ordinary business of life."<sup>1</sup> "The fundamental notion," says Smith, is that the tabooed object "is merely not safe for ordinary people to use; it has, so to speak, been touched by the infection of holiness, and so becomes a new source of supernatural danger."<sup>2</sup>

In higher stages of thought the idea approaches the popular notion that the unclean object has become hateful to God, and should be shunned by all who wish his favor. But according to the more primitive and fundamental notion, holiness was contagious, and things that came in contact with such taboo needed purification just as much as distinctly corrupted objects.<sup>3</sup> To show that unclean things are tabooed because of the inherent supernatural condition supposed to be connected

<sup>1</sup> W. R. Smith: *Rel. of the Semites*, p. 432. Quoted from Shortland's *N. Zealand*.

<sup>2</sup> *Op. cit.*, p. 431.

<sup>3</sup> W. R. Smith: *Rel. of the Semites*, p. 431; also Isaiah LXV, 5.

with it, it is known that some of the most tabooed things, as menstruous blood, bones of the dead, etc., are the most potent charms. According to Mr. Smith, "the heathen Arabs used to tie unclean things, dead men's bones, menstruous rags, upon children to keep away the *jinn* and the evil eye."<sup>1</sup>

"Primarily purification means the application to the person of some medium which removes a taboo and enables the person to mingle freely in the ordinary life of his fellows. . . . Purifications, therefore, are performed by the use of any of the physical means that re-establish normal relations with the deity and the congregation of his worshippers—in short, by contact with something that contains and can impart a divine virtue. For ordinary purposes the use of living water may suffice, for, as we know, there is a sacred principle in such water."<sup>2</sup> Blood, also, in its most primitive sacrificial idea was not used to wash away impurities, but to carry to the worshipper something of holy life. The idea of expulsion of an impurity is perhaps involved with the adding of sanctity. The evil may be dispossessed by inoculation with a more desirable life. This idea is seen in the Catholic Church in the exorcism of devils from the catechumen before baptism.<sup>3</sup>

In southern Egypt the child is bathed for the first time on the 40th day. From that time on it is no longer taboo, but pure. The same custom is chronicled of many primitive peoples, *e. g.*, the Aryans, Turanians, Polynesians, Semites, certain tribes in the Canary Islands, some Negroes and Indians. Long before the Christian era among the Norwegian Lapps, a Finnish people, infant baptism was a national custom. At the time of the ceremony the child was given a name and consecrated to a good, lucky and prosperous life. After every disease this ceremony was repeated and the child received a new name. This probably symbolized a new birth, received through the sacred potency of water, after which the child lost its old name and identity, and consequently could no longer be found by the evil spirits. New Zealanders baptize the child when eight days old. All the women of the neighborhood dip branches in water and sprinkle the child. At the end of a month the child receives a second name and a new baptism. The Tohunga (priest) dips a green twig into water and sprinkles the child, at the same time repeating his blessing in such ancient language that few understand it. This would indicate its remote origin. In the northern part of New Zealand the child is

<sup>1</sup> *Op. cit.*, p. 429.

<sup>2</sup> W. R. Smith: *Rel. of the Semites*, pp. 405-6.

<sup>3</sup> *Op. cit.*, pp. 406-7. For a general discussion of some of these topics see same work, *Taboos*, p. 143, *et seq.*; *Sacrifice*, p. 405, *et seq.*, *Note C*, p. 432.

dipped. The Papuans bathe (ceremonially perhaps) the child as soon as it can walk, when it receives a name. This is repeated several times. Many tribes do not bathe the child at all for months. The Uveans of the South Sea sprinkle the head of the child, and, like most primitive peoples, make the first bath of the child an occasion of festivity. In Java the child's head is shorn on the 40th day, and it is plunged into the river. Among the Battas the neighbor women await the birth of the child, which is immediately carried to the men, who take it to the nearest stream, give it a dip, while the father gives it a name. The Fiote Negroes baptized at three or four months, the child being dipped and sprinkled by all the community and given a name. The Basuto Negroes cook up some magic decoction and sprinkle the child with this. Upon the birth of a child among the Yoruba's of western Africa they send for the priest and ask for the name of some dead ancestor who intends to re-inhabit the child's body. They look upon this as a rebirth of the soul. They baptize and sprinkle the child's eyes with sacred water. In the lowlands of Scotland a new-born babe was bathed in salt water and made to taste it three times. The solution was considered strengthening to the child, and also obnoxious to the evil eye.

All these ceremonial lustrations indicate the widespread belief in the regenerating and life-giving power of water, and also its efficacy in removing taboo, so that the child could enter into harmonious relations with its new existence. Although I shall not enter into the subject of Christian baptism, we can easily recognize the older materialistic conception in the symbolism of spiritual regeneration which water holds in Christian baptism to-day.

#### WATER IN LITERATURE.

Space will permit only the briefest mention of the great influence that water has had upon literary expression. Poetry has kept alive the old animistic theory of nature. The poets, like children, are deeply animistic, and their expressions reflect the closeness with which they keep in touch with nature. Poetry is largely a conventionalization of child-like ideas. To quote Dr. Tylor there are moments in the civilized man's life when "he casts off hard, dull science and returns to childhood's fancy, [and] the world-old book of animated nature is open to him anew. Then the well-worn thoughts come back to him, of the stream's life that is so like his own; once more he can hear the rill leap down the hillside like a child, to wander playing among the flowers; or can follow it as, grown to a river, it rushes through a mountain gorge, henceforth in sluggish strength to carry heavy burdens across the plains.

In all that water does, the poet's fancy can discern the personality of life. It gives fish to the fisher, and crops to the husbandman; it swells in fury and lays waste the land; it grips the bather with chill and cramp, and holds with inexorable grasp its drowning victim."<sup>1</sup> Hence it is only a natural expression of animistic feelings to say

"The bubbling brook doth leap when I come by,  
Because my feet find measure with its call."

Or with Michael Bruce in Lochleven that

"The vales, the vocal hills,  
The woods, the waters, and the heart of man,  
Send forth a general song."

And with Joseph Warton, who added—

"And that all nature conspires to  
Raise, to soothe, to harmonize the mind."

The ocean has always impressed the poets strongly. Barry Cornwall's characterization of the ocean expresses the sentiments of many.<sup>2</sup>

"O, thou vast Ocean! ever-sounding Sea!  
Thou symbol of a drear immensity!  
Thou thing that windest round the world  
Like a huge animal, which downward hurled  
From the black clouds, lies weltering and alone,  
Lashing and writhing till its strength be gone.  
Thy voice is like the thunder, and thy sleep  
Is a giant's slumber, loud and deep.  
    . . . . . Oh! wonderful thou art, great element;  
And fearful in thy spleeny humours bent,  
And lovely in repose; thy summer form  
Is beautiful, and when thy silver waves  
Make music in earth's dark and winding caves,  
I love to wander on thy pebbly beach,  
Marking the sunlight at the evening hour,  
And hearken to the thoughts thy waters teach—  
Eternity—Eternity—and Power!"

The same writer says of the streamlet:<sup>3</sup>

"Gently it murmurs by  
The village churchyard, its low plaintive tone,  
A dirge-like melody,  
For worth and beauty modest as its own  
May not its course express,  
In characters which they who run may read,  
The charms of gentleness,  
Were but its still small voice allowed to plead?"

<sup>1</sup> E. B. Tylor: *Primitive Culture*, II, p. 209.

<sup>2</sup> Address to the Ocean.

<sup>3</sup> The Cataract and the Streamlet.

The poet Swinburne calls the sea "fair, white mother," "green girdled mother," "great, sweet mother," "mother and lover of men, the sea."<sup>1</sup>

James Russell Lowell regards the fountain as typifying great happiness.

"Into the starlight, Rushing in Spring,  
Happy at Midnight, Happy by day!  
. . . . Ceaseless aspiring, ceaseless content,  
Darkness or sunshine, thy element :—  
Glorious fountain! Let my heart be  
Fresh, changeful, constant, upward like thee!"

—*The Fountain.*

Dr. Biese<sup>2</sup> says of the peculiar charm of one of Goethe's scenes in *Faust*: "Die Herrliche Sommerabend-scene liegt im Keime mit den Worten: Ach demals, wie oft habe ich mich mit Fittigen eines Kranichs, der Ufer des ungemessenes Meeres geseht, aus den schäumenden Becher des Unendlichen jene schnellende Lebenswärme zu trinken und nur einen Augenblick in der eingeschränkten Kraft meines Busens einen Tropfen der Seligkeit des Wesens zufühlen, das alles in sich und durch sich hervorbringt." Again he quotes Pindar as saying:

"Des Menschenseele gleicht dem Wasser :  
Vom Himmel Kommt es zum Himmel steigt es,  
Und weider nieder zur Erde Muss es ewig wechselnd."<sup>3</sup>

Dryden's writings are full of references to water.

Miss Reynolds says,<sup>4</sup> as illustrative of Dryden's use of similitudes drawn from water, note the following: "Revenge and rage are sudden floods; joys are torrents that overflow all banks; contending passions are tides that flow against currents; fame is a swelling current; anger is a dammed-up stream that gets new force by opposition; a ruined life, destroyed fortunes are shipwrecks; love is like springtides, full and high, or like a flood that bursts thro' all dams, or like a stream that cannot return to its fountain, or like the tides that do not turn; the disappointed lover dies like an unfed stream; the mind of a capricious tyrant is like a vast sea, open to every wind that blows; the army of the enemy comes like the wind broke loose upon the main; an obdurate foe is as deaf to supplication as seas and wind to sinking mariners; an open mind is a crystal brook; grief undermines the soul as banks are sapped away by streams; the voice of a mob is like winds that roar in pursuit

<sup>1</sup> See Dr. Chamberlain's *Child and Childhood in Folk Lore*, p. 39.

<sup>2</sup> Alfred Biese: *Naturgefühls*, p. 385.

<sup>3</sup> Alfred Biese: *Naturgefühls*, p. 390.

<sup>4</sup> Myra Reynolds: *Treatment of Nature in Eng. Poetry*, pp. 28-9.

of flying waves; unspeakable anger is like water choking up the narrow vent of the vessel from which it is poured; and so on through a long list."

Religious rites and ceremonies are great conservators of ancient thoughts and customs. In hymnology we find innumerable metaphorical expressions of former literal beliefs. From a very few books I have collected nearly two hundred such verses, of which the following are typical:

"Behold I freely give, The living water, thirsty one,  
Stoop down and drink and live."

"When death's cold, sullen stream  
Shall o'er me roll."

"Safe into the haven guide. . . ."

"Bear me o'er life's fitful sea."

"Till I reach the golden strand,  
Just beyond the river."

"There's a precious fountain,  
Free to all a healing stream."

"Foul, I to the fountain fly."

#### FEELINGS OF PEOPLE AT PRESENT TOWARD WATER.

In the light of the preceding investigation let us consider the reactions of people toward water at the present. To carry out this study a syllabus (M. XV, Water Psychoses) was issued in February of the present year. Only a part of the list of questions contained in the syllabus have been considered in this paper. To some others the returns were too meagre to furnish any important data; others may be worked up in a subsequent paper. About 800 individual papers, some covering as many as 20 pages of letter paper have been considered in this report.<sup>1</sup>

*Feelings Toward Water in General.* Many like to be near water, and to watch it because it makes them feel happy, or because it has a "soothing effect." Some have "feelings of reverence such as they feel nowhere else, and they wish to be noble and pure." To some it "seems like a friend," "a great comfort," others "feel like confiding to it their sad thoughts."

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<sup>1</sup>I am under great obligations to the following persons who furnished large numbers of returns from their pupils: Professor Will S. Munroe, State Normal School, Westfield, Mass.; Professor Lillie A. Williams, State Normal School, Trenton, N. J.; Professor E. J. Swift, State Normal School, Stevens Point, Wis.; Principal E. M. Beaman, Fairchild, Wis.; Principal E. H. Cassels, Tomah, Wis.; Superintendent R. B. Dudgeon, Madison, Wis.; Principal E. L. Bolton, Tunnel City, Wis.; Principal Sarah E. Davies, Atlanta, Ga.; Miss S. Elizabeth Smith, Kaukauna, Wis.; Superintendent J. M. Barrow, Columbus, Miss. To the various assistant teachers, all the pupils, and those who sent individual returns, my obligations are also gratefully acknowledged.

Various reasons are given for liking it, such as: "it is so musical," "it affords such a variety of amusement," "so restful," "have natural instinct for it," "love it because it attracts me," "seems like human beings," "seems to soothe me," "seems to sympathize with me," "because it goes on its journey as a man does, sometimes placid, sometimes turbulent," etc.

The *time of day* and the state of the weather exercise a strong influence over the feelings. Bright, pleasant days bring feelings of "unutterable peace," "happy recollections," "joyousness," etc. When bright and windy some record feelings of "passionate joy, difficult to analyze because of their very intensity." To be near water in cloudy weather "makes me moody," "profoundly melancholy," etc. In the morning or at sunset a "keen delight" is felt. At dusk or in the moonlight "feelings of awe, wonder, sadness," "desire to be alone and not to be spoken to," "solemnity," etc. One records that if sky is dark and wind high "I feel as if I *must* let the water carry me somewhere—it matters not where, but somewhere away from myself."

*Storms* produce various effects. Some fear them, but more enjoy them, especially if they are used to being near water. Expressions concerning them are variously given, as: "the roaring and the rocking are pleasurable," "something about the vast amount of water with its easy, uncontrollable motion, ever changing, yet repeating the same forms that makes me exultant in its power," "was filled with the beauty and might of the waves," "one word, grandeur," "felt as though could scarcely breathe," "always feel as if water were alive and sending out its arms for prey," "seems like a great monster which would not hesitate to wreak its vengeance upon anything within its reach," "the rougher the sea the better I like it," etc.

*Running water* seems to produce a different effect from large expanses. As was noted elsewhere the Jews held running or living water in especial reverence. Small streams bring "a sort of dreamy, happy feeling," "an inward pleasure and happiness and excite to more vigorous action," "relief from sadness and reveries are of pleasant things," feelings of "jollity and fun." Brooks to many seem possessed of life—"like children, happy and gay," while rivers "typify greater maturity and exhibit purposeful action." Many record that they often steal away from all persons just to sit by a stream and watch it and listen to its music. They sit and meditate "upon the works of God." The beauties of ripples, eddies, color, its swiftness, its music, its majesty, all seem subjects for a poet's theme. One says that she "often fits words of poetry to the tune made by the rippling brook." A little girl of 5 said

brooks "must lead charmed lives, now flowing in the bright sunlight, babbling over the pebbles, now running through some quiet wood, where only the rustling of the leaves or the chirps of the birds disturb them."

*Large expanses* produce a quite different class of feelings. Such expressions as the following are very numerous: When viewing large expanses "I feel insignificant, stricken with awe, as though the supernatural were in the water," "makes me happy, contented, yet restless," "uncontrollable feelings of longing and half sadness," "sorrowful, especially if alone," "should like to be as pure as they are," "wish to always watch and never leave," "always loved the grand old ocean, and ever shall," "feelings less personal than when near small bodies, thoughts of a universal interest, of the God of the universe and of nature, rather than of a personal God," "enraptures me so I cannot help exclaiming at the grand spectacle," "awes me with its mightiness," "sad feelings increased," "desire to get to the place called the horizon," "wish to sail far away and explore unknown depths," "feelings of awe, reverence and solemnity," "it reveals nature's vastness and my own insignificance," "seems as if gazing into eternity," "feelings of sublimity; the absorption of my soul into the universal soul," "produce a yearning toward one far off divine event to which the whole creation moves," "Nothing so fair; so pure and at the same time so large, as a lake, perchance, lies on the surface of the earth," (Thoreau) "feel utterly powerless in its presence," "suggests power, deep thought, ability to keep grave responsibilities secret; representative of great persons, their silent yet powerful actions, compels me to submit to nature's plan and to realize that all its workings are in more perfect harmony than those of any individual."

*Waves, billows*, etc., are always objects of especial interest because of the activity and force displayed. The following expressions are typical: "make me feel as nothing compared with them," "ripples make me feel jealous; sometimes think of them as the laughter of children," "waves seem to be at play," "through waves nature displays her mighty power," "seem like great, lifeless monsters, moved by a mighty hidden force," "produce delight and admiration for their grandeur and beauty," "ripples make me think of our deeds,—sometimes good, sometimes bad; waves of our sorrows and joys,—how they swell and swell until they can grow no more, then suddenly burst," "remind me of waters of time, pessimists, shallow-minded men, unable to accomplish ends without friction; brute force instead of persuasion, selfishness, treachery."

*To be on the water* intensifies many of the emotions experienced when only looking upon the water.

The vastness of the universe, the power, beauty and grandeur of nature's hidden forces, the insignificance of individuals, the oneness of nature, the strength of the ties of kinship and friendships, the awful solemnity of being alone with nature probably never can be so forcibly realized as when in mid-ocean during a midnight storm. Brave hearts quake with fear, stalwart forms tremble, the pious and the blasphemous seek comfort and protection in prayer; all feel that the power of God is manifest and that his creatures must bow before his will.

When on the water "I feel nature's vastness and my own insignificance," "whenever alone with nature I feel how grand it is and how insignificant I am, but when on the water the feeling is much stronger," "have feelings of solemnity and think how soon the waves could swallow me up," "feel solemnity and reverence for God; that I am a part of this great world and that I have my duty to perform in making it beautiful," "in a boat I always feel caged," "have joyousness, solemnity, reverence, awe, and humility, but never real sadness."

*Children's Animistic Conceptions of Water.* The next three rubrics deal with the animistic conceptions of water which children have. We find that most of the answers are from children or are reminiscent experiences of older persons which refer to child life. The child, like the savage, conceives all nature endowed with life and it is only later at the approach of adolescent years and the dawning of self-consciousness that the differentiation between himself and surrounding nature becomes complete. Most children regard water, and in fact all nature, as endowed with life. Some ascribe to it animal life, others human life, and many talk to it. With few exceptions they think of it as talking but many do not think they can understand it. The older ones think of its animation in a more metaphorical way and not with the reality of childhood. In these childish expressions so frankly and candidly given we have the pages of the earliest stages of man's life opened to view. The savage heard the voice of nature talk to him with tongues understood only by the primitive mind; the child recapitulating the race history understands those same voices. The poet, like the child and the savage, penetrates what is invisible to ordinary mortals, and is cognizant of the same unseen powers. These he discloses to us through his versifications. To the ordinary mind these voices become hushed through the complex of psychic influences necessary to mature existence.

*Water as Endowed with Life.* 1. F., 12. Often think the water has wild life like animals.

2. M., 12. Think of it as a person; it seems as if it could talk.

3. F., 15. Seems as if it had life like a roaring lion.
  4. F., 13. Appears to be planning to do some wrong.
  5. F., 17. The noise of the ocean and of rapids give me a feeling that they have life.
  6. F., 17. Never talk to water. It seems to have life but not like animals or persons ; it gives one a different feeling.
  7. F., 15. When it attempts to drown me I think it has life.
  8. F., 14. The waves seem like snakes.
  9. M., 14. The waves make me think they are coming to catch me.
  10. F., 17. Billows, eddies, ripples seem endowed with life. They seem to think then act. Often think of the waves as temptations.
  11. M., 12. Think of the water as being kind of snaky.
  12. M., 18. Reared in the country and always thought of the water as being somewhat of a friend to me.
  13. F., 14. Seems alive ; don't know what kind of life, but the waves seem to be groaning.
  14. F., 18. Used to think it had life, but different from ours ; it was always a puzzle to me.
  15. F., 17. Used to think it had life like a person and was made to take care of little children.
  16. F., 20. When small thought it had work to do, and that it hurried along so fast because it had n't time to stop.
  17. F., 17. Used to imagine the water had life ; knew that it really had n't, but liked to think it had and that it was like a person.
  18. M., 18. When a child, frequently thought it had life and was talking as it rippled over its stony bed.
  19. F., 19. In a storm the waves and billows dash against one another and crowd and jostle each other as though their bed was too small for them.
  20. M., 13. Think of water having life like a person.
  21. F., 9. Seems alive, so human.
  22. M., 12. Think it is like animals because so wild.
  23. F., 11. Think of it having life like an intelligent animal.
  24. M., 11. Think it like a person, because it is so bright and knows how to work.
  25. F., 30. I am happier in the instinctive feeling that water has a kinship of life with me, than when I am under the rebuke of reason concerning such things.
- Talk to Water.* 1. M., 18. When small, I sometimes talked to water and asked it if it would be good and not wash away my water wheels.
2. F., 5½. Was sailing a boat ; the string broke and the boat went sailing away. She said, "Water, if you don't bring back that boat I'll tell mamma." Another time was heard to say to the brook, "I wonder where you go to ? Do you ever get tired ? I know I should." She says water must have life or it could n't move. Thinks it feeds on grass and sticks. Thinks rivers and brooks talk, but she cannot understand what they say. Thinks it must be saying, "How happy I am ! Nothing to do but play all day."
  3. F., 20. Used to scold when the ocean washed my sand houses away, calling it "a mean old thing !" After building them up again, I would say, "Come on now and enjoy it !"
  4. F., 12. Have talked to it in my mind, if not in words, many times and said I would like to plunge into it.
  5. F., 15. I talk to it as if it were a person I love very much and tell it all my little troubles.
  6. F., 41. As a child I said, "Pretty water, I like you. Where are you going ? Take me with you."
  7. M., 19. Never talked to water, but always recited a certain piece of poetry when near the shore.

8. F., 17. Used to ask the ocean to tell me what it saw way out from land and to tell me about the little girls it saw.

9. F., 18. Used to sympathize with water when rocks or stones were in its way, and would scold the stones and talk pityingly to the water.

10. F., 22. When watching waves chasing each other I have said to the one I wished to beat, "Oh, hurry, hurry!" Used to draw a line before my sand houses and say, "Now, you must n't come any further." When the houses were washed away, I said, "Horrid thing!"

11. F., 6. Scolded the river after a boy had been drowned. To punish it would not go near it for a week. When did go, thought the river was glad to see her.

12. F., 11. Never talked to it, but have often thought I should like to.

13. F., 10. Sometimes like to talk to it. Was sitting beside it and told it it made me feel cool and that I loved its little rippling music.

14. F., 18. Used to say, "Pretty, babbling brook, singing, laughing brook!"

The following paragraph gives some expressions that children think the water seems to use:

F., 10. "Ripple, ripple, ripple." M., 10. "Flip, flap, flip, flap." F., 12. "I am tired of running so long." M., 12. "For men may come, and men may go, but I go on forever." M., 13. "Come." M., 10. "I chatter over stony ways." M., 12. "Bubble, bubble, bubble." F., 13. "Come, bathe in this nice, warm water." F., 13. "Come along, we have no time to play." M., 12. "Roll on, roll on." M., 15. "I will swallow you up." F., 12. "Hiawatha, Wa-wa Tasi." M., 16. "Don't get near me or I'll take you out with me." M., 11. "Come, jump in." M., 13. "Won't you come in and have a swim." M., 14. "Let me get hold of you and I will swallow you up." F., 14. "I am stronger than you are." M., 11. "I am on my way to the ocean." M., 12. "I go on forever." M., 12. "I'm coming on through hills and vales and over stones to meet the ocean." M., 16. "Keep away from me. I'll drown you if I get the chance." F., 3½. After wading in the brook, told that the water said, "Oh, stay a little longer! Come along with me, I'll catch you." M., 10. "Trick, trick, trick." F., 11. "What part of you, little river, is the widest? and what kind of fish are swimming about in the water?" M., 10. "I would like to know your history and about your drifting ships." F., 12. "Have you had a pleasant journey? Do you expect to carry large ships?"

*Water seems to be talking.* 1. M., 12. Think it the most delightful thing to be near water, to watch it flow, and hear it tell of its wonderful adventures.

2. F., 15. I think the water seems to talk; it sounds like some sweet lullaby.

3. F., 18. In running it seems to be talking all the while.

4. M., 20. As a child, when playing in streams, I imagined the ripples sang, "Go home, go home!"

5. F., 18. The waterfalls seemed to laugh, but when dashing against the rocks I used to think it scolded because rocks were in the way.

6. F., 17. Thought the water answered what I said but thought I was too little to understand, but would when I grew older.

7. F., 41. It seemed to say it was very busy rushing on to the sea.

8. F., 20. Its music I hear, but it is a music entirely different to

my imagination from that of any human music—a music of nature, separate and distinct, as is also the wind's.

9. F., 17. At the beach the water used to seem to say, "Come on down, little girl, I love you." Once when I had ventured too far and my clothes became wet, I told my mother the waters had told me to come down and they would n't hurt me.

10. M., 12. Seems to be complaining, especially when there are rocks in a creek. Seems to be moaning when the tide comes in.

11. F., 19. When I first heard the ocean waves (at 13) I imagined they were saying something to us which we did not understand. Sometimes I thought them singing mournful songs. Always thought the waves were like queer people. Just as we were the inhabitants of the earth, they were of the water.

12. M., 10. Seems to say: "I have lived a hundred years and more, have fish, whales, snakes, and many other things."

13. F., 11. Seems to laugh on days when the sun is bright and moan sadly on a dark day.

14. F., 11. Think it talks, because trees talk. Think by their moaning they comfort the fish.

15. M., 12. It talks. Don't know what it says, but *it* knows.

16. F., 11. The largest bodies seem to talk and tell you great stories.

17. M., 13. Seems to be talking but not a language like ours; has a language of its own.

18. F., 11. Says "I work," and many other things.

19. M., 11. Some water seems to say "Follow me, follow me."

20. F., 10. Sometimes seems to tell me to bathe in it and it will refresh me. Also tells me of the journeys it takes.

21. M., 11. Seems to say "Come in and play, come in and play."

22. F., 17. Water was always talking to me, telling me of its little scrapes and trials and the fun it had.

*Earliest Feelings toward Water.* The general consensus of testimony relating to babies' actions on being first placed in tub baths, is that the water causes momentary fright when it first comes in contact with the skin. Almost without exception the verdict is that after the first shock and surprise are over babies take extreme delight in being in the water. This they manifest in various baby ways—by splashing about, by cooing and prattling, smiling and laughing, and by remonstrating against being taken out. After a few times at most the bath becomes a pleasurable event, and is looked forward to with keen delight. Of course, some exceptions are recorded, but they are very few indeed. When a little older, children often object to having their faces washed, but many reminiscent items indicate (although this question was not asked) that it is because children feel that it is a waste of legitimate playtime, and is not because of any objection to the water. The following answers are typical of great numbers received:

1. F. Mother says the first time I was put into a tub of water I did n't make a sound, but clenched my hands and stiffened my body.

2. An experienced nurse said most babies objected to their first bath, but usually changed.

3. F. Mother says when I was a baby I loved water and was still as a mouse when she washed me.

4. M., 7 mo. When put into the bath kicks and squeals with delight, but cries when his mother takes him out.

5. F. Mother says I enjoyed tub baths very much, and liked to play in the water.

6. F. Mamma says I used to jump for joy when she mentioned the word water.

7. M. Mother says at sight of water I used to want to jump right in.

8. F., 12. When about  $1\frac{1}{2}$ -2 yrs. old, one washing-day, I was all dressed to go out, bonnet and coat on, I climbed upon the chairs and got right into the tub with all my clothes on. Did n't mean to be naughty: was always a good child, but it was because I liked water. (A little boy did the same thing.)

9. F., 14. When small was afraid of water. Thought only fish could stay in it.

10. M., 14. Have always loved to be in the water. Remember the first time put into a tub—was about a year old.

11. F., 17. As a child liked to paddle and wade in water because I liked the feel of it.

12. F., 18. When a child was very fond of being near water, but was always afraid of reptiles. Think all children like to play in water.

13. F., 23. Did not like to bathe when a child, but it was because of the cold when they took me out.

14. F., 10. Like to paddle and wade in water. Enjoy bathing but shudder at coldness. Earliest fears of water were because afraid of drowning.

15. F., 17. When a child loved it. Seemed to be my dearest play-mate.

16. F., 20. Most enjoyable hours of my childhood were when we children went to the woodland brook to wade.

17. F., 14. Earliest recollections were of seeing some persons immersed, and I shouted "See them going into the pretty water."

18. F., 20. When about 12 loved to ride on rafts so well that I tried to construct one myself.

19. F., 17. When a child, during a storm at sea, would run away and just stand and watch it for hours from the shore. Never wanted to talk to any one. When all others were frightened, I was delighted. My love for the ocean is almost a passion: would rather be near it than anywhere else in the world.

20. F. Thought when water was happy it danced along in the sunshine, and when it was sad it was still. I was then sad, too.

21. F., 20. As a child loved small streams and always longed to lie down on the grassy banks and gaze upon the water as it danced along.

22. F., 18. Was fond of playing in puddles. Am told I used to sit under our old pump and pump water over myself.

23. F., 17. When I see streams always want to put my hand into the water.

24. F., 18. Was always running out in the rain and running away to the brook, where found, minus shoes and stockings, paddling around in the water.

25. F., 22. Many times when a child I ran away to go and play in the water. Had to be watched continually. Three times I ran away to the docks, fell off, and was nearly drowned each time, but all this did not frighten me away.

26. M., 7. So fond of the water almost impossible to keep him away from it. Would go swimming in deepest part of the brook as often as he could without his mother knowing.

27. F., 17. Earliest love for water was when very small. Father

took me in bathing and swam way out, while I was perched "piggie back" fashion. Thought it the nicest thing a little girl could do.

28. F., 20. At 3 my parents had hard time to keep me out of the water. After being dressed for the afternoon would wander to the stream to watch the boys fish and swim. Parents always knew where to find me.

29. M., 7-8. Always preferred companionship of water to children. Often begged to have a lunch and go and stay all day, returning only when sought. When he returned to the city would pine for the sea-shore and seemed to live only for the next summer. Was a different child when away from water.

30. F., 15. Likes water so well that when washing dishes she plays and dabbles in the water. Seems pleased and generally sings. (In one way, exceptional.)

31. M., 7. Forbidden to go near the water, but used to manage to go almost every day and remain in by the hour. In spite of all punishments this transgression continued.

32. F., 23. When 5 went to beach. Saw the waves and screamed with fright. Would not go in nor allow my mother to. She picked me up and in spite of myself carried me in. Soon liked and do yet.

33. F., 11. Loved the water in the river when I first went to bathe. Was very anxious to get into it.

34. F., 11. Like to paddle in it because I like to see the water splash.

35. F., 13. Like to wade and go as far out as I can without getting my clothes wet.

36. M., 12. Like to bathe in all kinds of water.

37. F., 11. Like to ride on planks and rafts because it has such a good feeling and is such fun.

38. M., 12. Love the water like a fish; don't know any boy who doesn't.

39. M., 11. Like to wade and paddle because I like to get wet.

40. F., 14. Don't know of any one who does n't like to wade and paddle. Children think it a great loss if near the water and cannot go in.

41. M., 13. Like to ride on planks, and when way out in the river we push each other off to get a good ducking.

42. M., 10. Would often conceal his books underneath the piazza, and generally go to the water.

43. Was out with a boy of 7 in one of worst storms of sleet, and yielded to his coaxing to sail chips down the gutter. It was the noon hour and he forgot his dinner. Soon many little boys joined. Do not believe one of those boys would have willingly forsaken that fun for the best dinner that ever tempted a child.

*Bathing.* 1. M., 16. Says of course he likes to bathe in streams or he would not walk to the bay, two miles away, every day.

2. F., 15. Often walked a mile to take a bath in a stream.

3. F., 17. To be in water gives one a feeling of exhilaration.

4. F., 22. Used to enjoy bathing in fresh water. Generally feel the water on my skin with great pleasure.

5. F., 19. Before 13 did not care for the water. Then was taken rowing, and have liked it ever since.

6. M., 13. Am very happy when the boys say "let's go two-fingers."

7. F., 15. Like to paddle in water because the water has a feeling different from anything else.

8. F., 10. Love to paddle in shallow water when there are no snakes nor blood-suckers.

9. M., 12. Feels sorry for the children of the far North, who, though so near the water, cannot bathe in it.

10. F., 17. Enjoy bathing very much. Think it is because of the water upon the skin and the buoyancy.

11. M., 20. Used to like paddling in shallow water, but was afraid of deep water. Always shudder on going into deep, cold water.

12. F., 19. Always enjoyed plunge baths, though I shudder at the thought of going in streams because of the coldness of the water.

13. F., 22. As a child was so fond of bathing in streams that often went in three times a day.

14. F., 20. At the thought of going in used to shudder because I thought it so cold, but the first plunge over it was a pleasure for me.

15. F., 30. Enjoy a sea bath with a feeling of mixed pleasure and fear; do not like a plunge tub bath; can't quite raise my will to the point of putting my head under water, but when at the beach let the surf meet me more than half way. Much of the shudder is from the cold, but more, I believe, from dread of being submerged.

The last two rubrics give fairly representative expressions relating to being in the water. Although some do not enjoy bathing and swimming, yet the majority of the returns indicate a passionate love for it. Many of the dislikes noted corroborate the deductions made by Dr. Hall in his study of water fears. The thought of the coldness of the water on taking the first plunge or after getting out brings the "shivers" to many, and act as a deterrent factor. It is safe to assert that could all temperature conditions be regulated perfectly, few would hesitate about bathing. Long centuries of wearing clothing has sensitized the body to feel keenly the changes of temperature. Savages, peoples inhabiting warm climates, and boys accustomed to daily "swimming and sunning" through the summer forget all about the possibility of disagreeable sensations. Even with babes it is only the first shock that frightens, and then they love the water passionately, often crying to remain in. The first contact produces a shock upon the dermal sense organ, causing a gasp and often a tremor, but it is because of the newness and not the disagreeableness. Again, the fear of smothering from submergence as in 15 is frequent. Fear of snakes, blood-suckers, and other water animals (8), deep, dark water (11), motion of the water are frequently mentioned as deterrents, but the "feel" and buoyancy are always listed with the pleasureable and attractive features. It is a matter of every-day observation that most children are extremely eager to be in the water, to play and paddle about in it, or to play in tubs of water. After every summer rain they can scarcely resist getting out and splashing in the pools in which they caper and frisk about in high glee. If allowed to, during the rain they will run out hatless and shoeless and let the rain pelt down upon them. Many boys in the country have been known to get out of sight, strip off all their clothing, and take the keenest delight in staying out in the driving rain. The

beaches, river banks and brooks during the summer months could attest to boys' love for water. Under severest protest they will run away to go swimming, and undoubtedly more cases of school truancy in the summer are attributable to this attraction than any other. One gentleman of middle age says that nothing is so restful to him as to plunge into the water and float around, oftentimes upon his back, gazing into the soft blue sky.

This universal love for water seems not to be due to experience alone, for all babes exhibit it in their earliest days, if conditions are supplied. It seems partly instinctive and of more than recent philogenic origin, and at least suggests a survival of the old time life in an aquatic medium. This is not demonstrable, but the weight of all testimony is in that direction. How else can we account for the passionate love of children to paddle, to splash, ride on rafts, run out in the rain; for their intense delight in swimming, even going without meals, walking long distances, enduring severe punishments, etc., just for the sake of being in the water? Many of these characteristics are exhibited by adults when the conventionalities of civilized life can be thrown off.

*Pedagogic Significance.* The natural tendency of children to get near to nature, indicates that while children are passing through this animistic stage that they can be brought into sympathy with the great book of nature without appealing to artificial and esoteric interests. They already commune with nature and should be encouraged and aided in understanding and appreciating more of its beauties. At this stage it should not be minutely dissected and studied apart from its natural setting. The child idea of oneness and harmony should not be carelessly destroyed. Injudicious teaching may create ideas that the soundest philosophical teaching of maturer years will fail to correct. The unity of nature which the child mind and the savage instinctively apprehend should be strengthened, not weakened. Nature should not be dissected and sliced and teased apart until nothing related remains. By so proceeding all interest is destroyed and the most fundamental and important lessons to be taught are abortive. The child on looking at the ocean or river or streamlet, feels them to be sentient beings like himself only of a different form. Even older persons say they seem so, and some say they are happier in the instinctive feeling that water has a kinship of life with them than when conceiving it otherwise. The ocean's boundlessness produces feelings of nature's vastness and one's own insignificance. Awe, humility, and reverence, the basal ideas in religion, are prompted, as so many of the returns show, by gazing upon vast bodies of water.

The various forms of water are most eloquent teachers. They appeal to the child's imagination in a way that no human being could. So many say that they want to be alone by the water to contemplate, to reflect. Their thoughts are turned from the disunited artificial life, enforced by the usual modes of living, and turned toward the unity and harmony which they discover for themselves when brought into contact with nature. Contact with nature is a more genuine eloquent exhortation to a contemplation of the Divine than all the preachers without the aid of nature. When alone with the forests, the rocks, or the deep, for companions, one's thoughts turn instinctively toward the contemplation of the universal, which cannot but lead to a search for the primal cause, for the constant, the all powerful,—for God.

From a purely pedagogical point of view the study has much suggestiveness. The child that is impressed with the thought of "how large the world must be!" and with "wonder about what could be seen if the eye could penetrate space" has aroused in him the most fundamental conditions of the learner, viz., wonder and curiosity. A permanent interest of this general form is to be most earnestly sought in all instruction. To wonder what and why, and to determine to understand more, is the highest type of interest. It surpasses all the passing, definable, artificial interests. This is interest self-determined, and if cultivated will prove permanent.

Child life loves nature. These returns show that many of the happiest of childhood hours are spent directly in contact with it. To separate the child from nature is like separating the savage from his forest home. The child, like the race, may develop later interests in other directions, but the transition must be natural and gradual, and the feeling of oneness with nature should never be relinquished. From the wading and paddling and swimming in the brook, and from the sound of the merry music of brook and cascade to the more mature contemplation of the majestic ocean, there is a charm and a delight which are the rightful heritage of childhood and youth. To rob childhood of the beauties and teachings of nature is to do violence to the normal course of development. The childhood of the race was spent in delightful contact with nature; the child, ontogenetically recapitulating the phylogenetic development of the race, craves instinctively for communion with nature.

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